

# Exchange Surfaces and Breathing

## 7.1 Specialised Exchange Surfaces

- Large multicellular organisms have a higher metabolic rate than small unicellular organisms because they have more cells.
- The demand for  $O_2$  and glucose to be supplied and  $CO_2$  to be removed much higher
- In large multicellular organisms the surface area to volume ratio is too small and the diffusion differences are too large and therefore the rate of diffusion is too slow to meet these demands alone
- Therefore, they have exchange surfaces like the lungs linked up to the organs by transport systems eg. blood

### Specialised Exchange surfaces:

- Compact
- Very large surface area
- Maintains gradients — ventilation (breathing) movements and movements of blood
- Reduced barriers (only 2 layers of cells so few cell membranes)
- Good blood supply
- Short diffusion distance — alveoli and capillary wall 1 cell thick, and cells are thin (squamous epithelium)
- Surface must be permeable — cell membranes are
- Way to pick up  $O_2$  easily — respiratory pigment

## 7.2 The Mammalian Gaseous Exchange System

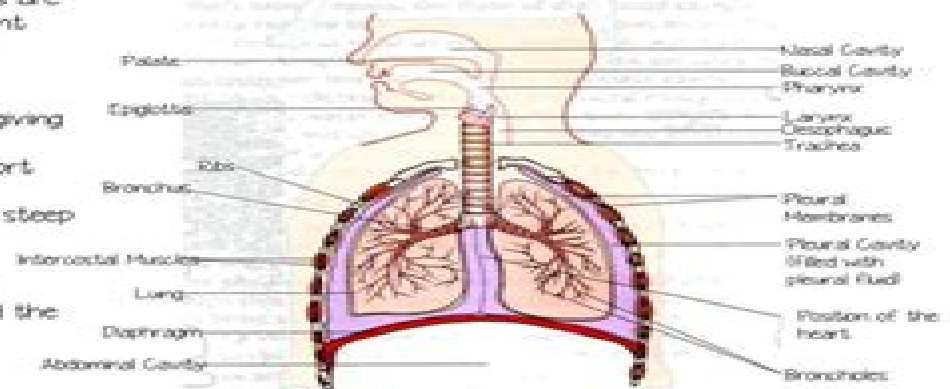
- Exchange surfaces have:
  - o Increased/large surface area — giving more area for diffusion
  - o Thin 1 cell thick wall — giving short diffusion pathway
  - o Good blood supply — maintains a steep concentration gradient
  - o Good ventilation — maintains steep gradients for  $O_2$  and  $CO_2$  between the blood in the air and the lungs

## 7.1 SPECIALISED EXCHANGE SURFACES

## 7.2 THE MAMMALIAN GASEOUS EXCHANGE SYSTEM

## 7.3 MEASURING THE PROCESS

## 7.4 VENTILATION AND GAS EXCHANGE IN OTHER ORGANISMS



| Tissue              | Function/Adaptation in the lungs  |
|---------------------|---|
| Cartilage           | <ul style="list-style-type: none"> <li>- Holds the lumen of the trachea and bronchi open/gives support</li> <li>- Prevents collapse of the trachea/bronchi during inhalation</li> </ul> |
| Goblet Cells        | <ul style="list-style-type: none"> <li>- Secrete mucus to trap bacteria, viruses and dust particles. Mucus contains water and mucin proteins</li> </ul>                                 |
| Ciliated Epithelium | <ul style="list-style-type: none"> <li>- Move in a coordinated way to move/sweep mucus up from the lungs towards the throat</li> </ul>  |
| Squamous Epithelium | <ul style="list-style-type: none"> <li>- Very thin lining cells found in alveoli</li> <li>- Provides short diffusion distance for gas exchange</li> </ul>                               |
| Elastic Tissue      | <ul style="list-style-type: none"> <li>- Stretched during inhalation</li> <li>- Recoil during exhalation to help increase air pressure/help air be expelled from the lungs</li> </ul>   |

# Ocr Biology Gcse 2013 Answers

**Natalie King**



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**Independent Schools Yearbook 2012-2013** none, 2013-06-20 The highly respected book of reference of sought after Independent Schools in membership of the Independent Schools Council s Associations HMC GSA The Society of Heads IAPS ISA and COBIS *Parliamentary Debates (Hansard)*. Great Britain. Parliament. House of Commons, 2012 Food Loss and Waste Reduction Laxmikant S. Badwaik, Cristóbal Noé Aguilar, A. K. Haghi, 2021-09-30 Focusing on the crucial sustainability challenge of reducing food loss at the level of consumer society this volume provides an in depth research based overview of this multifaceted problem It considers the myriad environmental economic social and ethical factors associated with the enormous amount of food waste which also end up wasting water air electricity and fuel which are necessary for food processing This book uniquely examines the social and cultural views of food waste management shedding new light on the topic by emphasizing the consumer household perspective throughout Drawing on a wide variety of disciplines the book presents philosophical reflections practical examples and case studies and potential solutions to the problem of increasing food waste **Gcse Biology Ocr Gateway Answers (for Workbook)** Richard Parsons, 2006-08 GCSE Biology OCR Gateway Answers for Workbook **GCSE Biology for OCR 21st Century** Bethan Parry, Alison Popperwell, 2016

**Revision Plus Ocr A Gcse Biology Workbook Answers** E. Attridge, 2008-02-01 **Revision Plus Ocr B Gcse Biology Workbook Answers** Jacqui Punter, 2008-02-01 **GCSE Biology OCR 21st Century Higher Answer Book** Richard Parsons, 2007-09-01 GCSE Biology OCR 21st Century Answers for Workbook Higher **GCSE Biology CGP Books**, 2016 **Aqa Gcse Biology Essentials Workbook Answers** N. Goodman, 2007-12-01 **OCR Gateway GCSE Biology** Natalie King, 2011-09 With clear and concise revision notes that cover everything you ll need to know for the exam this effective OCR GCSE Biology revision guide supports active revision for students working at all levels Plenty of quick tests and practice questions test and reinforce understanding of the key content Providing a student friendly uncluttered approach to GCSE revision this OCR Gateway additional Biology B revision guide is suitable for all levels and contains succinct revision notes and practice questions that focus on the core content needed for the exams Included in this book clear and concise coverage of all the exam assessed content simple and engaging explanations quick tests and practice questions throughout to test and reinforce understanding key words and supporting glossary Separate units differentiated by colour and labelling exam style questions at the end of each unit overview of How Science Works *GCSE Biology* Ciara McGlade, Rachel Rogers, Sean Walsh, 2016 **GCSE Biology for OCR Gateway** Jack Davies, OCR Gateway GCSE Biology Student Book Jo Locke, 2016-04-24 These new resources have been written to match the 2016 OCR GCSE Gateway Science 9 1 specifications Built in assessment and differentiation supports students of all abilities and makes progress tracking easy Maths skills and practical skills are developed throughout with ramped practice questions and differentiated learning outcomes *Gcse Ocr Coordinated Science Biology P* Richard Parsons, 2002-12 These Foundation level CGP

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