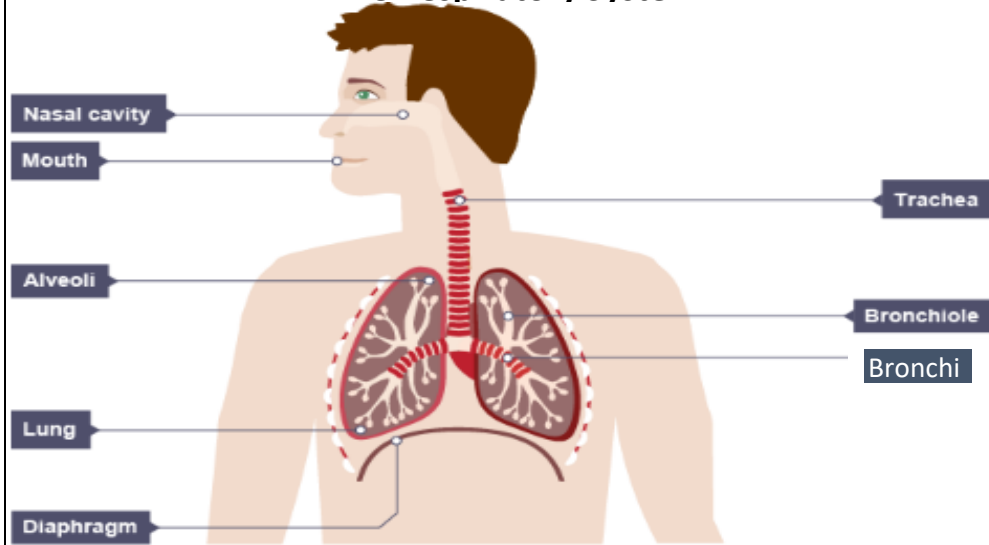


The Respiratory System



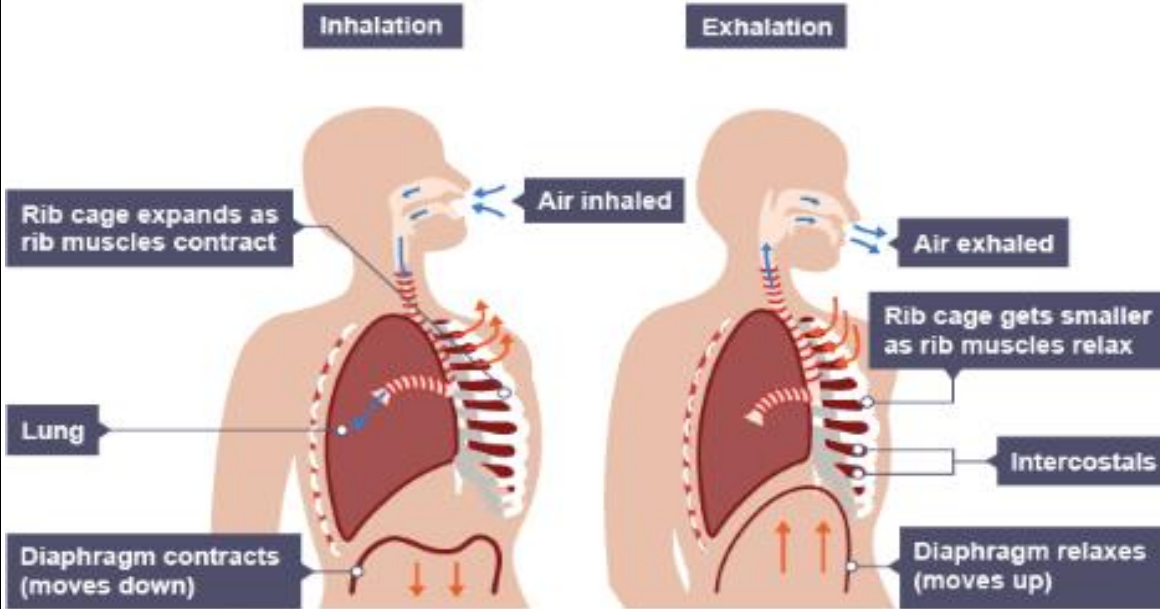
Passage of air into the lungs

1. Air enters the body and is warmed as it travels through the mouth and nose.
2. It then enters the trachea.
3. The trachea divides into two bronchi. One bronchus enters each lung.
4. Each bronchus branches out into smaller tubes called bronchioles. Air travels through these bronchioles.
5. At the end of the bronchioles, the air enters one of the many millions of alveoli where gaseous exchange takes place.

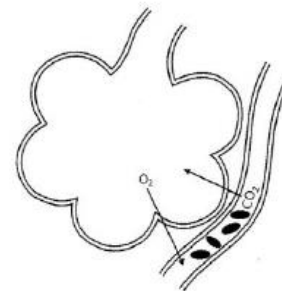
Key terms:

- Respiratory Rate:** the number of breaths taken per minute.
- Tidal Volume:** The amount of air breathed in and out in one breath.
- Minute Ventilation:** The amount of air breathed in and out in one minute.
- Gaseous exchange:** happens through at the alveoli and working muscles transferring oxygen and carbon dioxide.
- Diffusion:** is the movement of gases from an area of high concentration to an area of low concentration.
- Aerobic:** respiration with sufficient oxygen eg. Marathon runner
- Anaerobic respiration:** respiration with insufficient oxygen eg. 100m sprint

The mechanics of breathing



Inhaling	Exhaling
Diaphragm contracts and moves downwards	Diaphragm relaxes and moves upwards
Intercostal muscles contract moving the ribs upwards and outwards	Intercostal muscles relax moving the ribs back downwards and inwards
This increases the chest cavity decreasing pressure forcing air into the lungs.	This decreases the chest cavity increasing pressure, forcing air out of the lungs.



Gaseous exchange and diffusion:

- Oxygen within the Alveoli diffuses across the capillary cell wall into the blood. The red blood cells take the oxygen to the working muscles.
- Carbon dioxide in the blood diffuses from the blood in the opposite direction into the alveoli to be breathed out. The carbon dioxide is a bi-product of the working muscles.

Short term effects of exercise	Long term effects of exercise
Cardiovascular system <ul style="list-style-type: none"> • Increased heart rate • Increased stroke volume • Increased cardiac output • Redistribution of blood (vascular shunt) 	Cardiovascular system <ul style="list-style-type: none"> • Cardiac hypertrophy • Lower resting heart rate • Increased stroke volume and cardiac output (during exercise) • Capillirisation.
Respiratory system <ul style="list-style-type: none"> • Increased respiratory rate • Increased tidal volume • Increased minute ventilation 	Respiratory system <ul style="list-style-type: none"> • Increased strength of respiratory muscles (intercostal and diaphragm) • Increased tidal volume (during exercise) • Increased minute ventilation (during exercise)
Muscular system <ul style="list-style-type: none"> • Increased muscle temperature • Increased oxygen supply to working muscles • Increased lactic acid production (anaerobic) 	Muscular system <ul style="list-style-type: none"> • Muscular hypertrophy • Increased muscular strength • Increased muscular endurance increased resistance to fatigue

Possible exam questions:

Top tip. There are lots of possible questions on paper 1 around the cardiovascular, respiratory and muscular system linked o the short and long term effects of exercise. By learning the key terms and diagrams you will be able to achieve the best marks.

Correctly label a diagram of the lungs (1 mark)

Describe the passage of air through the respiratory system (1 mark)

Using a practical example explain diffusion? (2 marks)

Define respiratory rate, minute ventilation and tidal volume (3 marks)

Describe the short term effects of exercise on the cardiovascular system (3 marks)

Describe the short term effects of exercise on the muscular system (3 marks)

Describe the short term effects of exercise on the respiratory system (4 marks)

Describe the short term effects of exercise on the body of a football player as he begins his game (5 marks)

Using a practical example explain vascular shunt (5 marks)

Describe the long term effects of exercise on the muscular system (3 marks)

Describe the long term effects of exercise on the respiratory system (3 marks)

Describe the long term effects of exercise on the cardiovascular system (3 marks)

Describe the long term effects of a strength programme for a rugby player (3 marks)

What is capillirisation? (1 mark)

Describe the role of the respiratory muscles for a basketball player when playing in a game. (4 marks)

Respiratory System

Correctly label a diagram above (1 mark)