KEY STAGE 4 – NCFE LEVEL 1/2 TECHNICAL AWARD IN HEALTH & FITNESS – YEAR 10

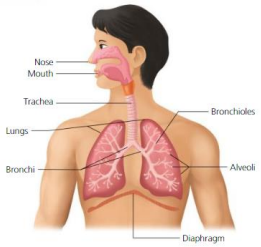
CONTENT AREA 1.3 – RESPIRATORY SYSTEM

Big Picture: To Develop a Broad Understanding of the Structure and Function of the Body Systems

Structure

Learners will understand the **pathway of air** through the respiratory system and how to locate the following structures:

- Nose
- Mouth
- Pharynx
- Larynx
- Trachea
- Lungs
- Bronchi
- Bronchioles
- Alveoli



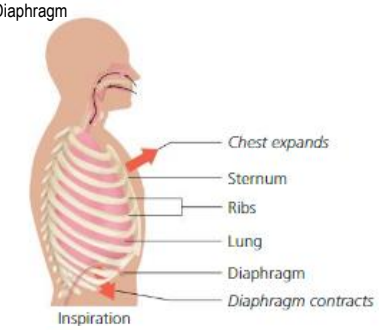
- Ribs
- Diaphragm
- Intercostal muscles

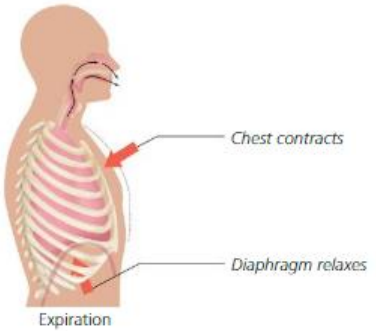
NICE MATURE PUPILS LET TEACHER'S LUNGS BREATHE BEAUTIFUL AIR

Function

The learner will understand the **mechanics of breathing in** (inhalation/inspiration) and **breathing out** (exhalation/expiration) and the role of:

- Intercostal Muscles
- Ribs
- Diaphragm





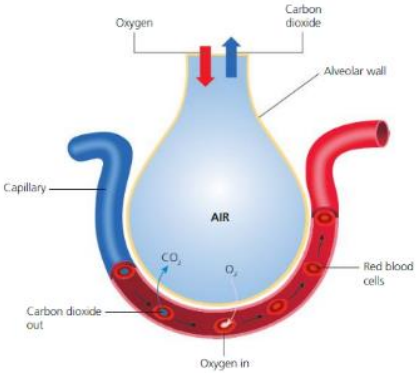
Gaseous Exchange

The learner will understand the terms 'diffusion' and 'gaseous exchange' and the features of the alveoli that assist gaseous exchange:

Diffusion
Gas moving from a high concentration to a low concentration.

Gaseous Exchange
The movement of oxygen and carbon dioxide between the alveoli and the capillaries in the lungs.

How the Alveoli assist Gaseous Exchange:
- moist, very thin walls (one cell thick).
- provide large surface area for gaseous exchange to occur.
- short diffusion pathway.
- surrounded by capillaries.



Measurements

The learner will understand how to interpret the spirometer traces:

Breathing Rate (BR)
The number of breaths taken in a minute.
Tidal Volume (TV)
The amount of air that enters the lungs during normal inspiration at rest.
Residual Volume (RV)
The amount of air left in the lungs following a maximal exhalation.
Vital Capacity (VC)
The maximum amount of air that can be exhaled after taking the deepest inhalation.
Inspiratory Reserve Volume (IRV)
The amount of extra air inhaled.
Expiratory Reserve Volume (ERV)
The amount of extra air expired.

Changes

The learner will understand the respiratory changes that happen from rest to participating in health and fitness activities:

- muscles demand more oxygen as they work harder.
- heart rate increases to pump blood.
- rate and depth of breathing increases to:
- meet oxygen demands.
- release carbon dioxide through exhalation.

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HOMEWORK / SUPPORT / UNDERSTANDING

The key questions, key vocabulary & assessment level guidance below can all be used for Homework/Home learning on this topic

Key Questions

Define inhalation/inspiration and exhalation/expiration.

Explain how the diaphragm and intercostal muscles work to help the breathing process.

State what the gaseous exchange is.

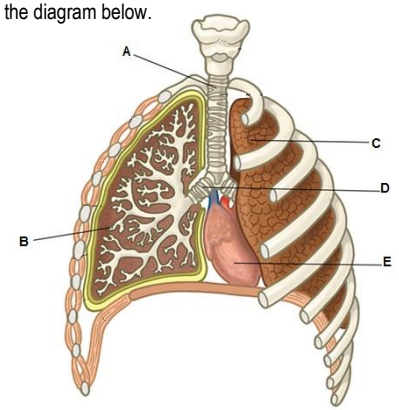
Describe the process of the gaseous exchange.

Explain the process of diffusion during gaseous exchange at the alveoli.

Outline the structure of alveoli and explain how the structure helps them perform their function.

State what happens to tidal volume during exercise.

Label the diagram below.



Key Vocabulary

Alveoli – The tiny air sac where oxygen and carbon dioxide are exchanged.
Breathing – The process of bringing in fresh air to the lungs and expelling "used" air.
Bronchi – One of the larger air tubes found in the airway after passing through the trachea.
Bronchioles – One of the smaller air tubes found in the airway after the bronchi.
Capillary – The smallest blood vessel that allows an exchange between oxygen and carbon dioxide.
Carbon dioxide – The gas that is produced as a waste material during respiration.
Diaphragm – Large muscle at the base of the rib cage that contracts to make more room for the lungs during inhaling.
Diffusion – When particles move from a more-concentrated area to a less-concentrated area.
Epiglottis – The flap that covers the larynx while swallowing food.
Exhale – When "used" air is expelled from the lungs.
Inhale – When fresh air is brought into the lungs.
Intercostal muscles – The muscles between the ribs that help lift the rib cage outward and upward during inhaling.
Larynx – The area of the throat (pharynx) where sounds are produced for communication.
Lung – The organ that brings in air to a place where oxygen and carbon dioxide can be exchanged.
Mouth/nose – The main entry and exit points for air during breathing.
Nasal cavity – The area behind the nose where air first enters from the outside of the nose.
Oxygen – The gas that cells need in the respiration process in order to make energy.
Pharynx – The area below the nasal cavities and behind the mouth where air travels before entering the larynx.
Respiration – A process where air is taken in by the body and sent to the lungs, oxygen is extracted and sent to the rest of the body, energy is created by the cells using sugar and oxygen, carbon dioxide is released as a waste material and sent back to the lungs, and finally the carbon dioxide is released from the lungs.
Respiratory tract – The pathway that air takes while breathing.
Thoracic cavity – The space inside your body which contains your heart and lungs and other related organs.
Trachea – The main air tube in the respiratory tract that is located directly below the larynx.

Assessment Method

Written Examination - 40% of the technical award

Written examination:
• 80 marks.
• 1 hour 30 minutes.
• a mixture of multiple-choice, short-answer and extended-response questions.

The written examination is a terminal assessment and will assess the learner's knowledge and understanding of all content areas.

The examination is set and marked by NCFE. The assessment assesses learners' knowledge and understanding of the content areas of this qualification.

A variety of assessment questions will be used, including multiple-choice, short-answer and extended response questions. This will enable learners to demonstrate their breadth of knowledge and understanding of the subject and ensure achievement at the appropriate level, including stretch and challenge. Questions will be written in plain English and in a way that is supportive and accessible to learners of all abilities.

The examination date is expected to take place in May/June every year. Please refer to the external assessment timetable available on the NCFE website.

(**Remaining 60% is the internal assessment is at school**)