



P.E. PRESENTATIONS (ADVANCED)

- UTILIZES THE PROVEN BENEFITS OF THE STAGED DISPLAY OF INFORMATION
- VISUALLY ENHANCES ANY 16+ EXAM COURSE IN PHYSICAL EDUCATION
- SUITABLE FOR A SINGLE COMPUTER, NETWORK, DIGITAL PROJECTOR OR VLE
- FOCUSES ON THOSE 'DIFFICULT' TOPICS RELATED TO HUMAN PHYSIOLOGY!

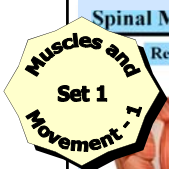
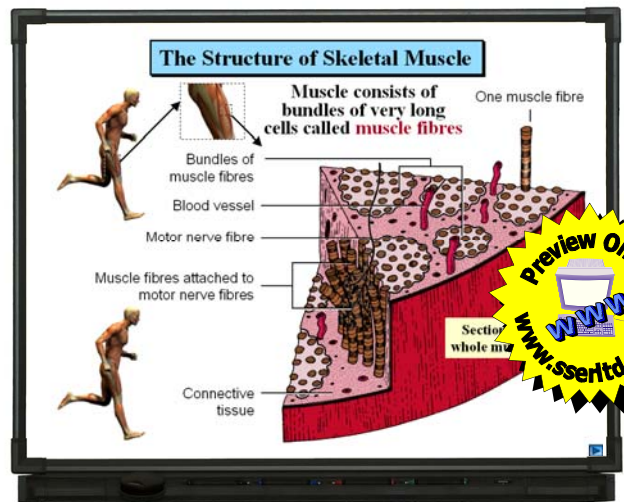
Students' interest and learning is enhanced when you use our outstanding sets of PowerPoint presentations for P.E./Sports Studies A level or any other 16+ P.E. course. These two superb sets of presentations, enable you to use interactive whiteboards, standalone or networked PCs, to enhance teaching and learning in a variety of ways.

The presentations feature animation, voice narration videos and interactive elements which engage students in this demanding section of the core theory content. The presentations average 25 slides each and feature high quality diagrams throughout.

Note templates are also included and are ideal for teacher narration notes, lesson plans and student notes. Each note template contains screenshots of three adjacent slides and room for ample notes to be made - see page 3 for further details.

Set 1 (11 presentations) focuses on movement (featuring superb animations) and the structure and function of muscles and joints.

Set 2 (8 presentations) focuses on the respiratory and cardiovascular systems and will enable you to focus students attention and to deliver these topics with ease and clarity.



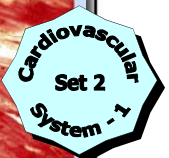
Spinal Muscles

	Rectus abdominus	Erector spinae group
Origin	Pelvis	Ribs, vertebrae and pelvis
Insertion	Sternum and ribs	Ribs, cervical & thoracic vertebrae
Action	Flexion of spine	Extension of spine

Cardiac Muscle

Cardiac muscle is similar to skeletal muscle in that it is **striated**, and similar to smooth muscle in that the **nuclei** are centrally located. It differs from both skeletal muscle and smooth muscle in that its cells **branch** and are joined to one another via **intercalated discs**. Intercalated discs allow **communication** between the cells such that there is a **sequential contraction** of the cells from the bottom of the ventricle to the top, facilitating **maximal ejection** of blood from the ventricle during contraction.

In a healthy heart, cardiac muscle never fatigues - Why?



SET 1

11 PRESENTATIONS & NOTES

MOVEMENT PLUS THE STRUCTURE & FUNCTION OF MUSCLES & JOINTS

Joints and Movement - 1

Ball and socket joint

Hinge joint

Gliding joint

Saddle joint

Condyloid joint

Pivot joint

Set 1 (11 Presentations covering 5 Topics)

- Skeletal Muscle Structure - 1 & 2
- Muscles and Movement - 1, 2 & 3
- Strengthening Exercises
- Joints and Movement - 1 & 2
- Motion and Movement - 1, 2 & 3

Anatomical Position

The description of anatomical movements is more accurate if reference is made to **anatomical planes**.

Frontal / coronal plane

Transverse / horizontal plane

Joint movements can be described in relation to each plane, e.g. **abduction** involves lifting a limb part away from the body's central axis (midline) in the **frontal plane**.

Joints and Movement - 2

Mechanics, Motion & Movement - 3

Each of these actions in their stability.

most stable

least stable

A

B

C

D

E

Reaction Forces

Mass of athlete = 70 kg

Weight = $mg = 700 \text{ N}$

2100 N

2100 N

- This sprinting athlete **pushes hard** into ground with a force of 2100 N.
- The ground exerts an **upward force** of 2100 N.
- The **net** upward force on the athlete is therefore 1400 N ($2100 - 700$).
- The reaction force from the ground is **greater** than the athlete's weight and an upward acceleration results.
- Force = mass x acceleration ($F = ma$).
- $F = 1400 \text{ N}$ and mass = 70 kg.
- Acceleration = Force ÷ mass = $1400 \text{ N} \div 70 \text{ kg} = 20 \text{ ms}^{-2}$.
- There is an upward acceleration of 20 ms^{-2} .

Mechanics, Motion & Movement - 2

Muscles and Movement - 1

Muscles and Movement - 1 (ppt)

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11 presentations covering 5 topics:

- 1. Skeletal Muscle Structure - 1 & 2**
- 2. Muscles and Movement - 1, 2 & 3**
- 3. Strengthening Exercises**
- 4. Joints and Movement - 1 & 2**
- 5. Motion and Movement - 1, 2 & 3**

SET 2

8 PRESENTATIONS & NOTES

FOCUSING ON THE HEART & THE RESPIRATORY & CIRCULATORY SYSTEMS

Set 2 (8 Presentations covering 2 Topics)

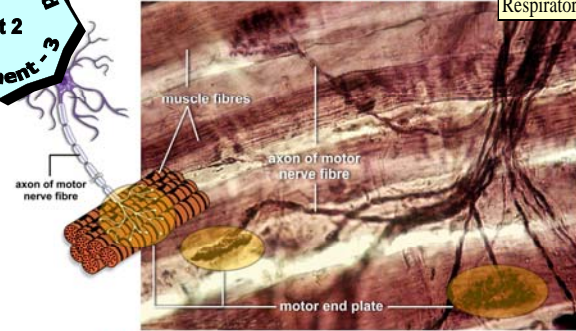
Cardiovascular System - 1, 2, 3, 4, & 5

Respiratory System - 1, 2, & 3

Muscles and Movement - 3
Set 2

Motor Units

A single motor neuron and the muscle fibres it stimulates make up a MOTOR UNIT.



The muscle fibres within a given motor unit are all of one type (fast or slow fibres). However, a whole muscle is a mixture of different fibre types.

Skeletal Muscle Structure & Function - 7
Set 2

The Banding Pattern of Skeletal Muscle

Under a light microscope the striated nature of skeletal muscle can be observed. This is seen as a regular alternation of light and dark bands.

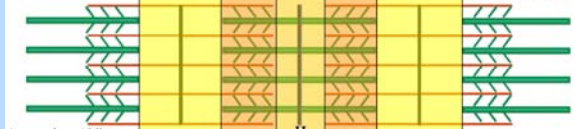
This banding pattern is due to the arrangement of the thick and thin filaments within the myofibrils.

Dark bands (A bands) appear where thick myosin filaments are located.

Light bands (I bands) appear where there are thin filaments only

I BAND A BAND I BAND

The edges of the A bands are very dark as thick and thin filaments are present together



Across the middle of each I-band is a dark line called the Z line. The section of myofibril between these Z lines is the SARCOMERE

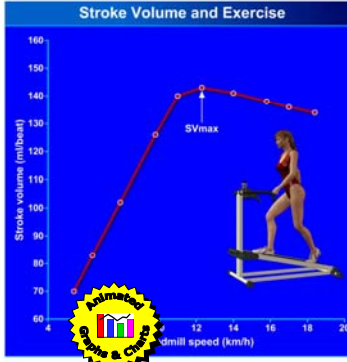
The centre of the A band contains thick filaments only and is slightly lighter (H Zone)

Cardiovascular System - 2
Set 2

Stroke Volume Response To Exercise

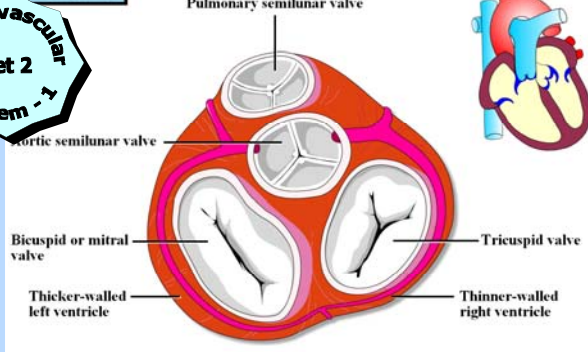
Stroke volume (SV) initially increases linearly as exercise intensity increases. The relationship only holds up to 40-60% of maximum exercise intensity. Beyond this point, SV values plateau and then fall as exercise intensity (and hence heart rate) increases.

- Maximum stroke volumes are reached during sub-maximal exercise (40-60%).
- Stroke volume increases from 70 ml per beat at rest to maximal values of around 120-140 ml per beat during exercise.
- The reserve end systolic volume (ESV) is utilised during exercise to allow stroke volume and cardiac output to increase.



Cardiovascular System - 1
Set 2

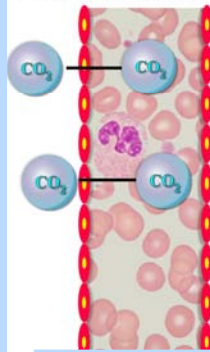
Heart Valves



HEART VALVES VIEWED FROM ABOVE

Carbon Dioxide (CO₂)

Blood carbon dioxide and respiratory activity.



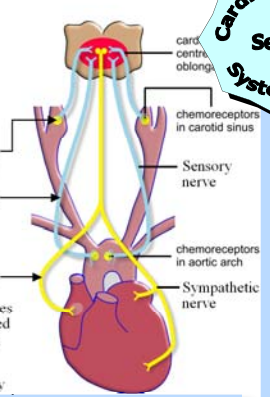
CO₂ dissolves in the blood plasma and the blood becomes more acid; (lowering of blood pH)

Chemoreceptors in the carotid sinuses and aortic arch detect the change in pH

The chemoreceptors respond by transmitting impulses along sensory nerves to the cardiac control centre

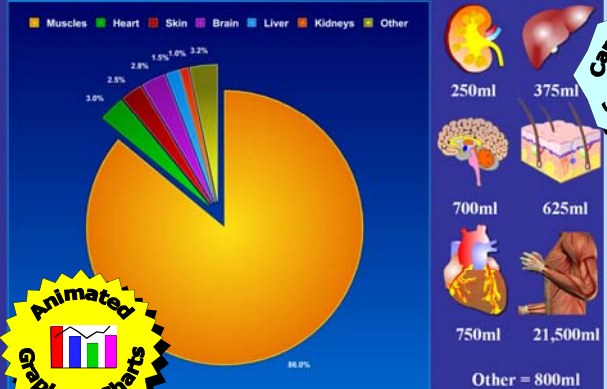
The cardiac centre stimulates the sympathetic nerves that innervate the SA and AV nodes and the myocardium; the speed of impulses transmitted along these nerves increases

Increased sympathetic activity



Cardiovascular System - 3
Set 2

Distribution of Cardiac Output during Strenuous Exercise

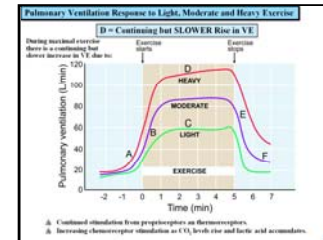


Animated Graphs & Charts

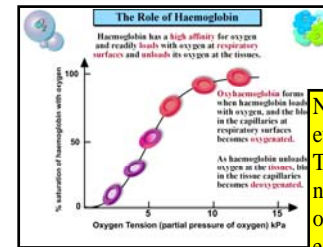
Cardiovascular System - 5
Set 2

The Respiratory System - Part 2 - Notes

Slide 5

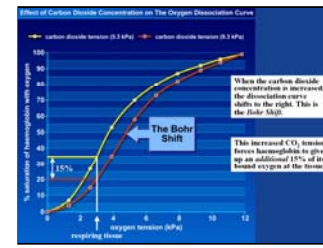


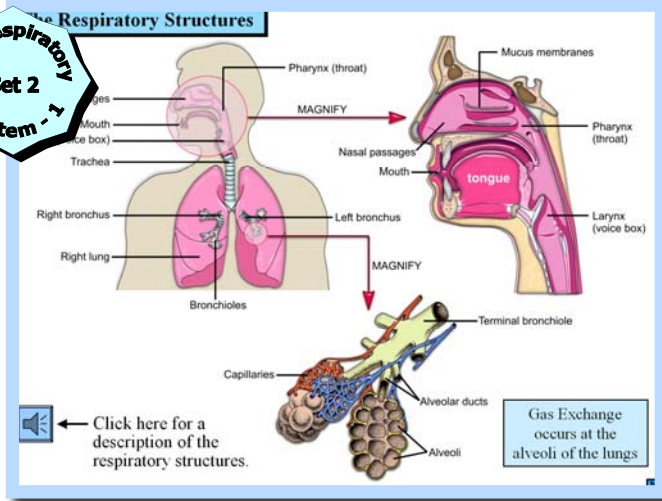
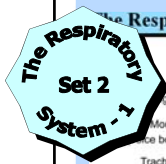
Slide 6



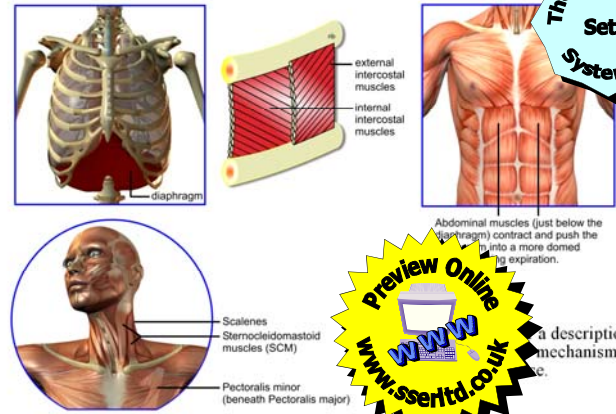
Note templates are provided for every slide - 3 slides per page. These are perfect for a teacher's narration notes and lesson plans or for student notes. The notes are easily printed in full colour or b/w.

Slide 7





Mechanics of Respiration During Exercise



The Single User licence is provided with the Presentations CD ROM and allows you to place the presentations on one teacher's home PC and also on one PC at school - this allows you to use a digital projector to project the presentations to any class(es), in any room, as long as the presentations are only loaded onto the one PC. The site licence extends the single user licence to an unlimited number of standalone or networked PCs on a single school site. The VLE licence is additional to a site licence and extends the permitted use to allow students and staff to access the resource externally through the school's Virtual Learning Environment (password protected access only). To obtain an evaluation CD or for details of our low cost VLE licence please phone 01509 816704.



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