TEL PE Revision

Revision Series 2023

OCR A-level Physical Education

Paper 1

• Notes pages •

The EverLearner

How to use this revision session and notes

- Complete this document when doing the live or on-demand revision shows.
- Have the National Mock Exam to hand and, ideally, your completed, marked version of it.
- Have the exam infographics to hand. These will be referred to throughout the show.
- Focus on the skills that James is presenting as much as the content. In most cases, students have a knowledge of the topic but struggle to respond to the command in the question. This is a focus of our revision.
- Complete the notes spaces as extensively as possible and, if necessary, return to the show to complete it more than once in order to make the fullest notes possible.

My ticklist:

- ☑ Notes pages
- ☑ Exam infographics
- ☑ Exam paper
- ☑ Exam mark scheme
- ☑ Exam model answers

Performer profiles

Use these performer profiles when making examples and developing your A02 skill. The list is not exhaustive and you are encouraged to use your own examples as well as these ones.

Josh

Basic Details
Age: 19
Sport: 100m Sprint
Level: Olympic Podium Potential

Tom

Basic Details
Age: 43
Sport: Tennis (singles and doubles)
Level: Novice

Kate

Basic Details
Age: 17
Sport: Triathlon
Level: Club

Laura

Basic Details
Age: 15
Sport: Gymnastics (Artistic)
Level: National

Julie

Basic Details
Age: 26
Sport: Netball (GD, GK)
Level: Semi-professional/National

Carlos

Basic Details
Age: 35
Sport: Wheelchair basketball
Level: Ex-national team

Material covered in the **National Mock Exam**

➔ Green denotes content to be covered in this session.
➔ (#) denotes the number of marks on Paper 1 since 2018.

1.1 Applied anatomy & physiology

- Joints, movements and muscles (2)
- Muscle function and types of contraction (1)
- Analysis of movement (24)
- Skeletal muscle contraction (3)
- CV system - Cardiac values (2)
- Blood redistribution and venous return (9)
- Gas exchange (0)
- ATP/PC system (9)
- Exercise in the heat (2)

1.2 Exercise physiology

- Diet and nutrition (2)
- Ergonenic aids - Pharmacological (3)
- Aerobic training - Fitness tests (5)
- Aerobic training (0)
- Strength training - Adaptations (5)
- PNF training (0)
- Periodisation (6)
- Injury rehabilitation (0)

1.3 Biomechanics

- Centre of mass and stability (3)
- Levers (2)
- Linear motion (15)
- Fluid mechanics (0)
- Downward force (0)

Section 1: Analysis of movement (hip, knee & ankle)

Between 2018 and 2022, Paper 1 exams have covered the following movement analysis:

Movement analysis in exams					
Year	2018	2019	2020	2021	2022
Joint	Wrist	Knee and ankle	Elbow	Elbow	Knee
Marks	6 x AO3	5 x AO2	6 x AO3	4 x AO3	3 x AO3

Section B

6. Look closely at this image.
Analyse the landing phase on the box by completing the table.

Joint	Type of joint	Joint movement	Agonist
Hip	A	B	C
Knee	D	E	F

These performers are completely still in the ready position before a speed skating race.
Complete the table to analyse this position at the ankle.

Joint	Articulating bones	Type of movement	Agonist	Type of contraction
Ankle				

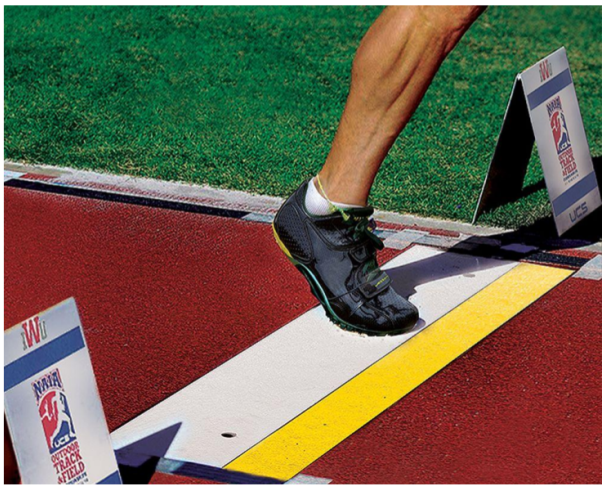
Notes

Complete the table to analyse the lunge action at the hip.

Joint	Phase	Joint movement	Agonist	Type of contraction during the downward motion
Hip	Left (front)			
	Right (back)	Extended	Illiopsoas	

Notes

Complete the table to analyse the long jump take-off action at the ankle.



Joint	Type of joint	Joint movement	Agonist	Plane of movement
Ankle				

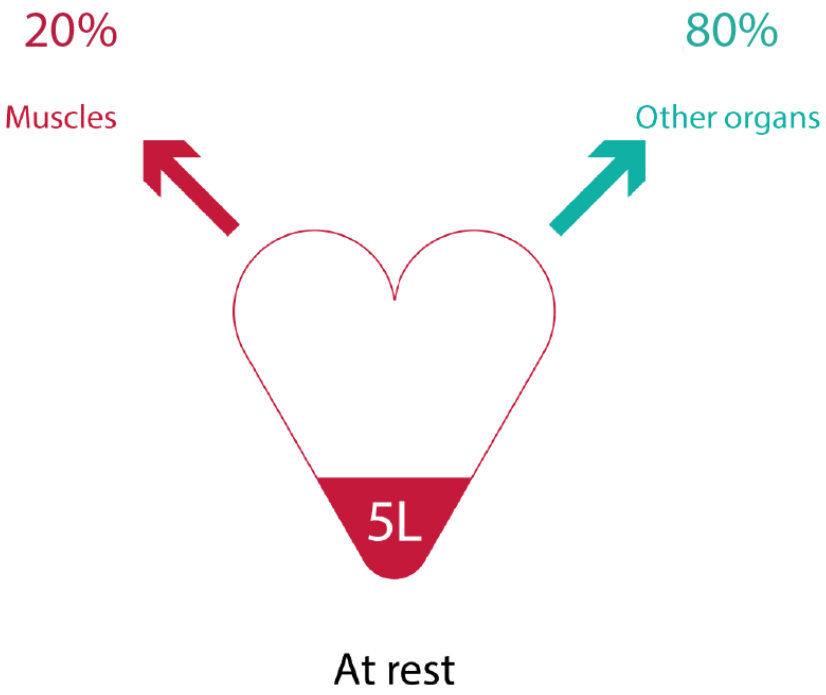
Notes

Complete the table to analyse the box-jump **landing** action at the hip **and** the knee. The performer is still in the **downward** motion .

Joint	Type of joint	Joint movement	Agonist
Hip			
Knee			

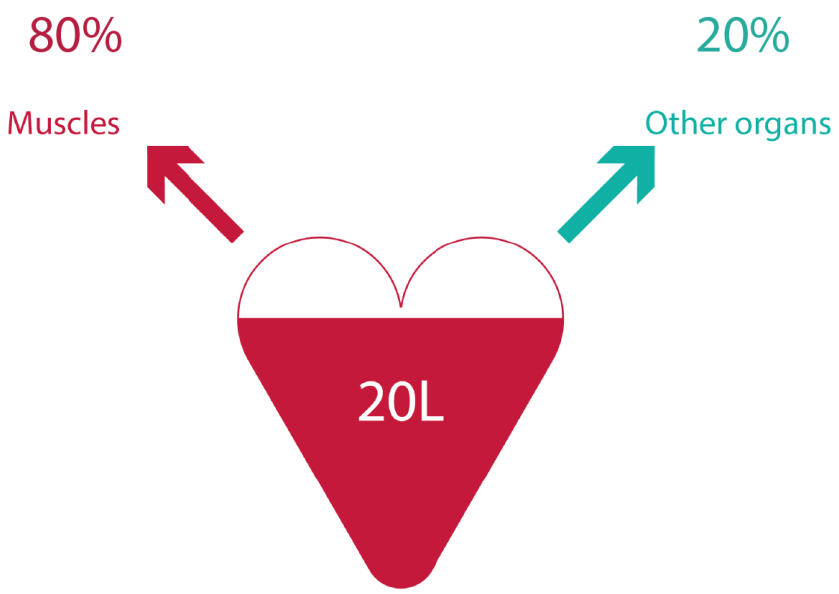
Notes

Section 2: Redistribution of blood & venous return



At rest

Notes

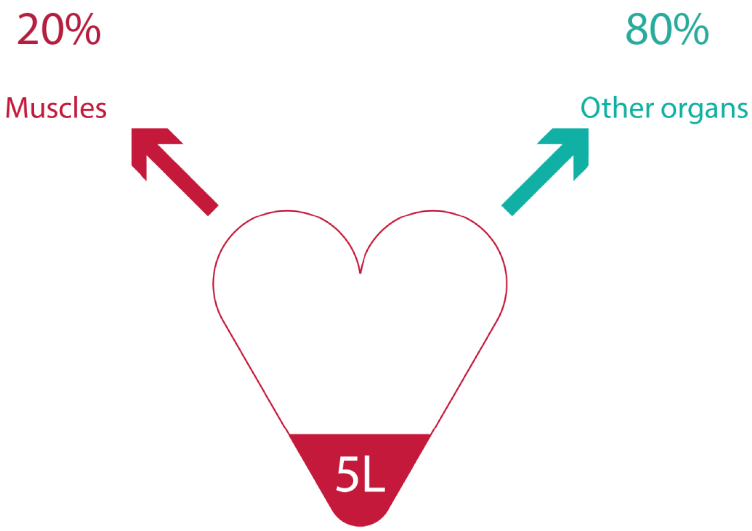


Maximal exercise

- Arterioles leading to the working muscles vasodilate.
- Precapillary sphincter muscles leading to the capillary beds at the working muscles vasodilate.
- Vascular shunt occurs.
- Q shunted through central capillary to increase resistance to blood flow and redirect to the skeletal muscle.
- Arterioles leading to the other organs vasoconstrict.
- Precapillary sphincter muscles leading to the capillary beds at the other organs vasoconstrict.

Notes

Distribution of Q during recovery



At rest

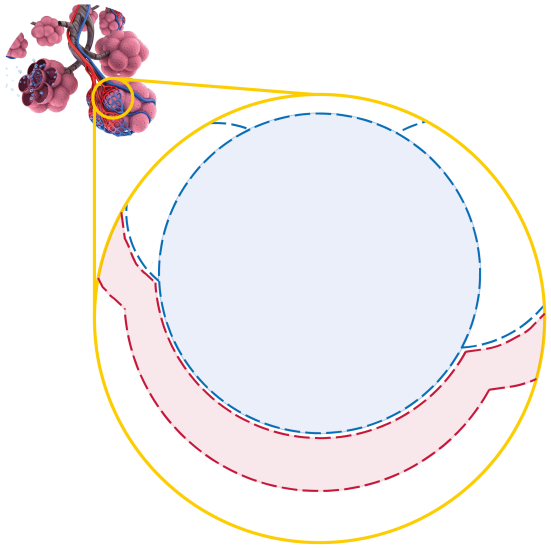
- Q shunted through central capillary at the muscle to increase resistance to blood flow and redirect to the other organs.
- Q shifts from 80% to skeletal muscle down to 20% to skeletal muscle gradually.
- Arterioles leading to the working muscles vasoconstrict.
- Precapillary sphincter muscles leading to the capillary beds at the working muscles vasoconstrict.
- Arterioles leading to the other organs vasodilate.
- Precapillary sphincter muscles leading to the capillary beds at the other organs vasodilate.

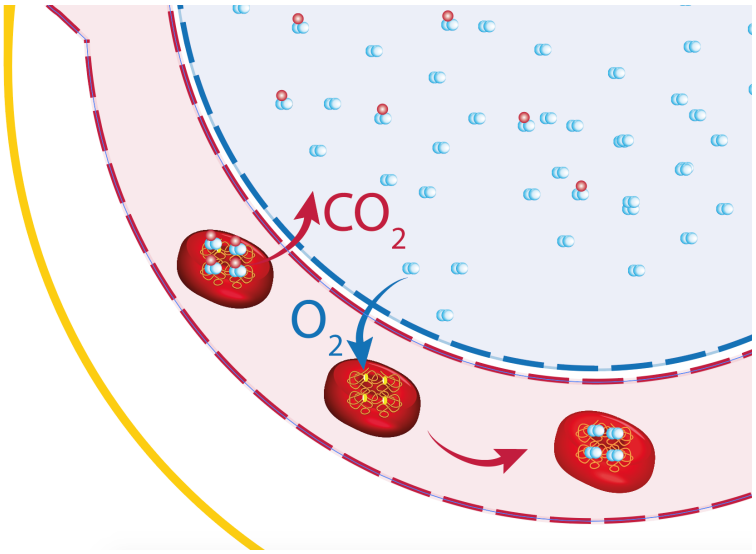
Notes

Venous return during exercise and recovery					
General	Gravity	Smooth muscle within veins	Pocket valves within veins	Respiratory pump	Skeletal muscle pump
Venous return is the volume of blood returning to the right atrium.	Blood from the superior areas of the body return to the heart via the superior vena cava.	Pulses to increase blood pressure.	Prevent backflow of blood.	Action of the respiratory muscles contracting during inspiration causes an increased pressure in veins close to the heart.	Veins run through skeletal muscles.
Starling's law	During inversion, the opposite occurs. This can be applied to elevated leg shakes.	Lumen within veins which are normally large, becomes less and blood is forced back to the heart.	During diastole	Harder we breathe, the more the impact.	Action of muscular contraction causes an increase in blood pressure.
SV = venous return			Only positioned in veins		Jog back into position.
			More frequent in more distal (from the left ventricle) veins		Perform an active cool-down.

Notes

Section 3: Gaseous exchange





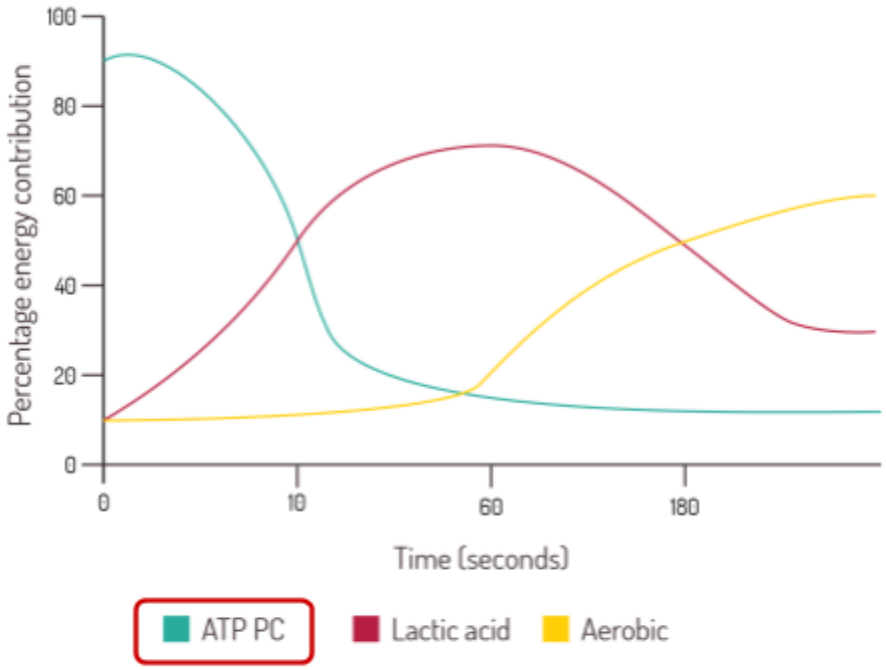
Notes

Effect of differing intensities of exercise and recovery on gas exchange at the alveoli and muscle			
Exchange at rest	Exchange during submaximal exercise	Exchange during maximal exercise	Exchange during recovery
Through the process of diffusion	**Increased** diffusion gradient	**Further increased** diffusion gradient	
Net movement of gases down the diffusion gradient from high to low concentration across a partially permeable membrane	**Greater quantities** of oxygen move from high concentration in the alveolus to **even lower** concentration in the capillary	**Yet even greater** quantities of oxygen move from high concentration in the alveolus to **yet even lower** concentration in the capillary	
Oxygen moves from high concentration in the alveolus to low concentration in the capillary	**Greater quantities** of carbon dioxide moves from **even higher** concentration in the capillary to low concentration in the alveolus	**Yet even greater quantities** of carbon dioxide moves from **yet even higher** concentration in the capillary to low concentration in the alveolus	
Carbon dioxide moves from high concentration in the capillary to low concentration in the alveolus			

Notes

Section 4: ATP/PC system

Interplay of energy systems during intermittent exercise			
Factor	ATP/PC	Glycolytic	Aerobic
Intensity	Very high intensity/Maximal	High intensity	Moderate intensity
Duration	Up to 10s duration	Up to 120s duration	Up to 2 hours duration
Recovery periods	• 50% recovery in 30s • 100% recovery in 2-3 minutes • Work relief ratio: 1:3+	• 5 minutes recovery • Work relief ratio: 1:2	• No recovery other than repaying 02 deficit created by anaerobic work • Work relief ratio: 1:1 or less
Fitness level			

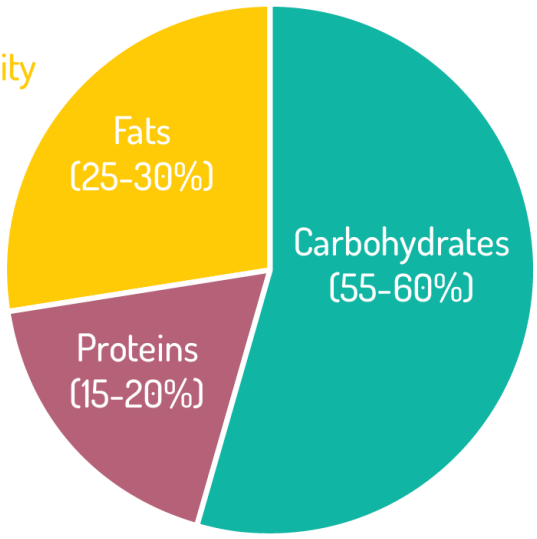


ATP/PC System	
Fuel source	
Controlling enzyme	
Yield	
By products	
Type of reaction	

ATP/PC System Evaluation	
Strengths	Weaknesses

Section 5: Diet and nutrition

- Energy
- Insulation
- Cell function (membrane)
- Broken down into glycerol and fatty acids
- Stored under the skin
- Excellent for low-intensity exercise
- Slow-digesting but energy-rich



- Energy
- Stored as glycogen in the muscle and liver
- Processed into sugar (glucose)
- Energy source of glycolytic and aerobic system
- Up to two-hour store

- Growth
- Repair
- Adaptation process
- Very small quantity of energy (non-preferred)
- Broken down into amino acids
- Delivered to ribosomes
- Rebuilt into human proteins
- Can form muscle tissue
- Can form haemoglobin
- Can form hormones
- Can form enzymes

Notes

Function of...		
	Minerals	Iron: Hb
		Phosphorous: muscle contraction
		Calcium: bone growth
	Vitamins	For general health
		B12 for energy release
		Vit C for immunity
	Fibre	Digestion
		Regularity of stools
		Keeps large intestine healthy
		Absorbs water
	Water	Maintain hydration
		Cell function
		Blood plasma

Notes

Energy Intake

Maintaining weight

Energy intake = Energy expenditure

Gaining weight

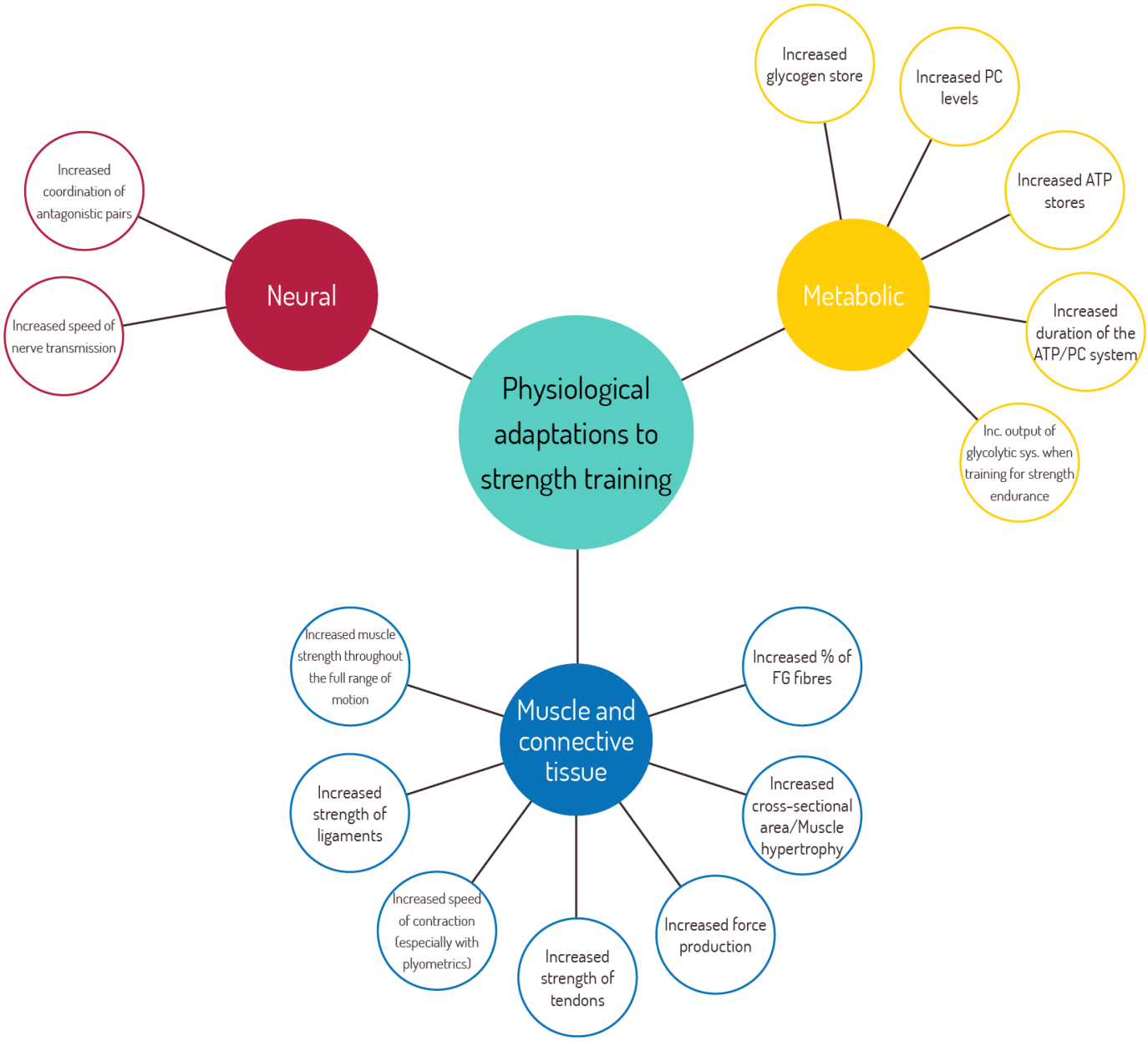
Energy intake > Energy expenditure

Losing weight

Energy intake < Energy expenditure

Notes

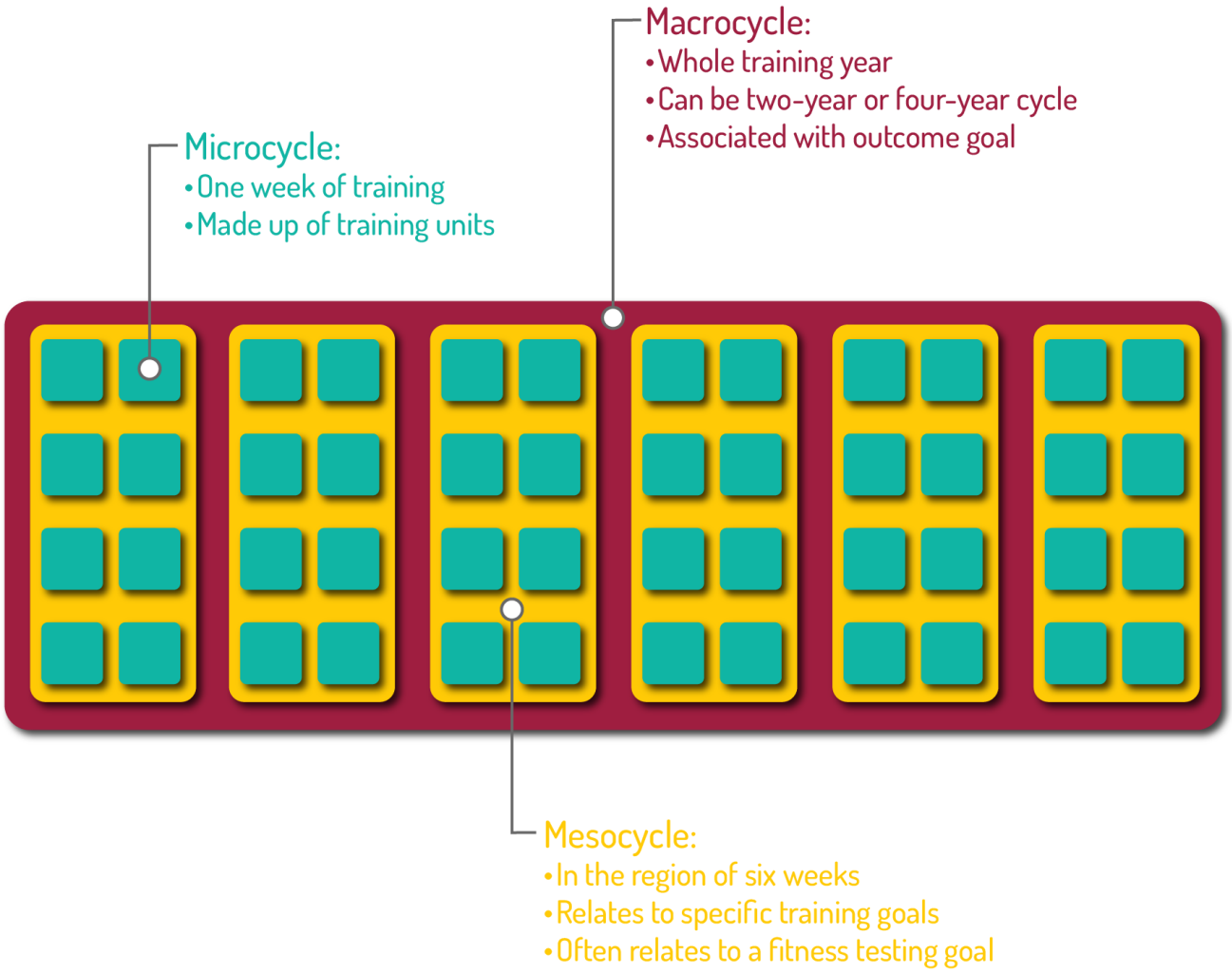
Section 6: Strength training adaptations



Notes

Section 7: Periodisation

Aim: To reach peak fitness and, therefore, performance at the appropriate moment in a training cycle.



Preparatory phase	?	?
• 6-12 weeks before the start of the season • June and July for a football club	• Perform, recover, train, taper	• 4-6 weeks at the end of the season • Active rest, recuperation and recovery

Section 8: Rehabilitation from injury

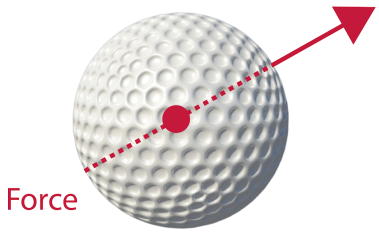
Treatment of injuries					
Simple fractures	Stress fractures	Dislocation	Sprain	Torn cartilage	Exercise-induced muscle damage
• Call for medical attention • Isolate injured body part • Immobilise • Apply ice if pain allows • Provide pain relief/anti-inflammatories if appropriate	• Notice signs • Seek x-ray and confirmation • Apply ice • Complete rest • Non-weight bearing activity	• Call for medical attention • Immobilise • Do not attempt to relocate • Apply ice if pain allows • Provide pain relief/anti-inflammatories if appropriate	• Immobilise • Painkillers or anti-inflammatories • Apply PRICE • Strap/brace the joint • Return to movement gradually beginning with non-dynamic activity • Only return to dynamic movement after full recovery	• Reduce movement at the joint • Painkillers or anti-inflammatories • Apply PRICE • Strap/brace the joint • Seek medical advice/scan • Surgery to repair the tissue • No blood supply so will not heal itself • Monitor over time to identify signs of arthritis	• Stop activity • Painkillers or anti-inflammatories • Apply PRICE • Seek medical advice/scan • Apply hot-cold treatment once healing has begun • Massage • Physiotherapy • Return to movement gradually • Strengthen injured muscle over time

Notes

Section 9: Linear motion

Linear Motion

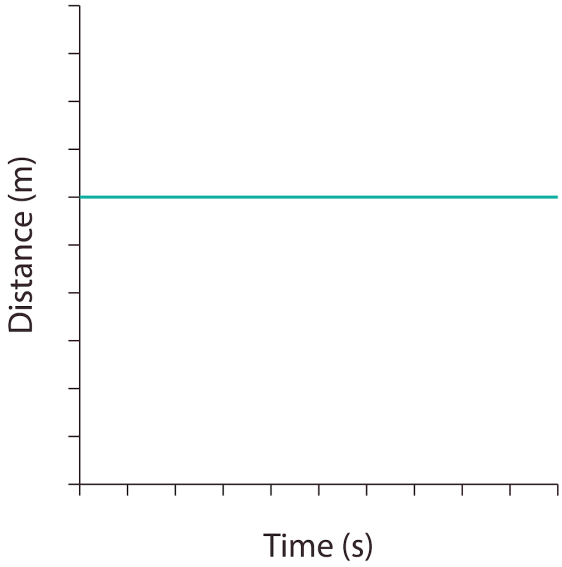
All parts of a body move in a straight line or curve in the same direction, at the same time, at the same speed.



Notes

Term	Definition	Formula	Unit
Distance	Total length of path covered from start to finish/From position A to position B	Speed x Time	Metres (m)
Displacement	Shortest straight line route from start to finish/From position A to position B	Velocity x Time	Metres (m) in a specific direction
Speed	Rate of change of distance	$\frac{\text{Distance}}{\text{Time}}$	Metres per second (m/s)
Velocity	Rate of change of displacement	$\frac{\text{Displacement}}{\text{Time}}$	Metres per second (m/s) in a specific direction
Acceleration	Rate of change in velocity	$\frac{\text{tV} - \text{iV}}{\text{Time}}$	Metres per second squared (m/s^2)

Notes



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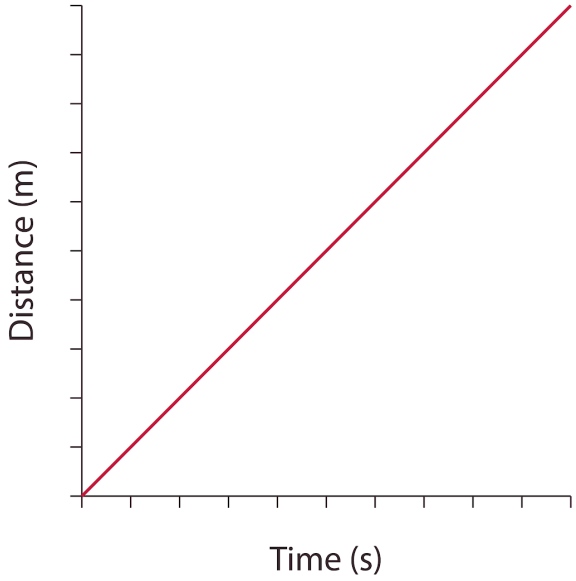

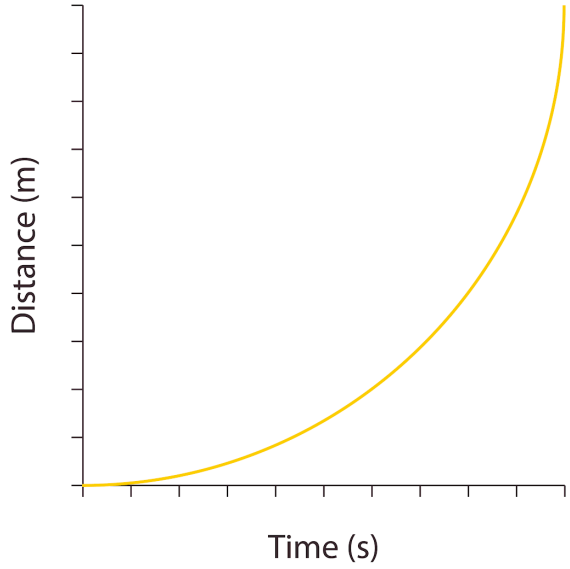

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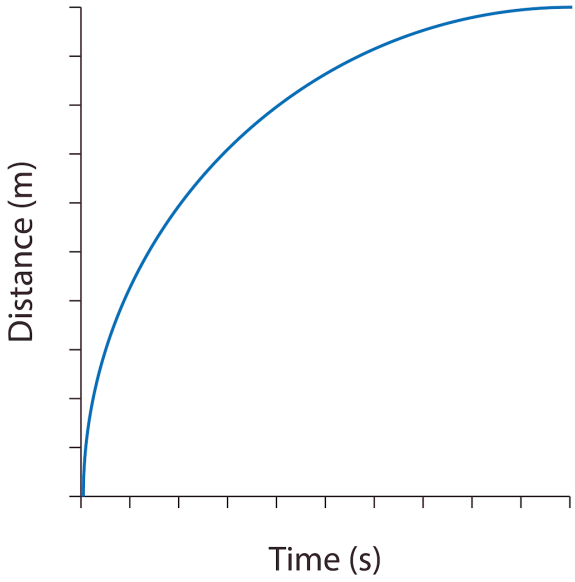
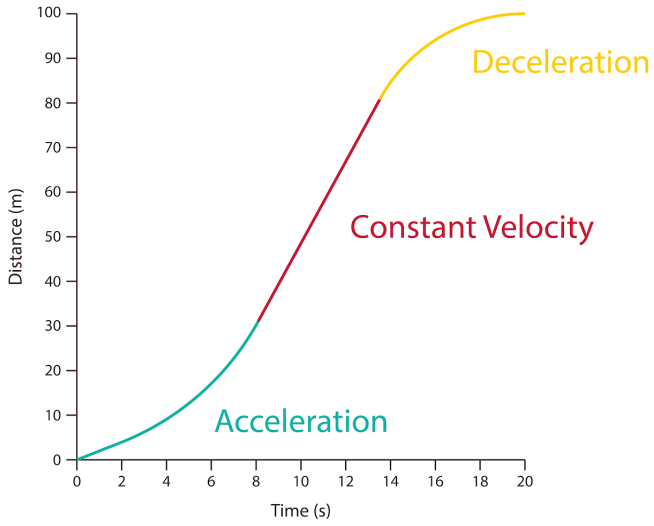


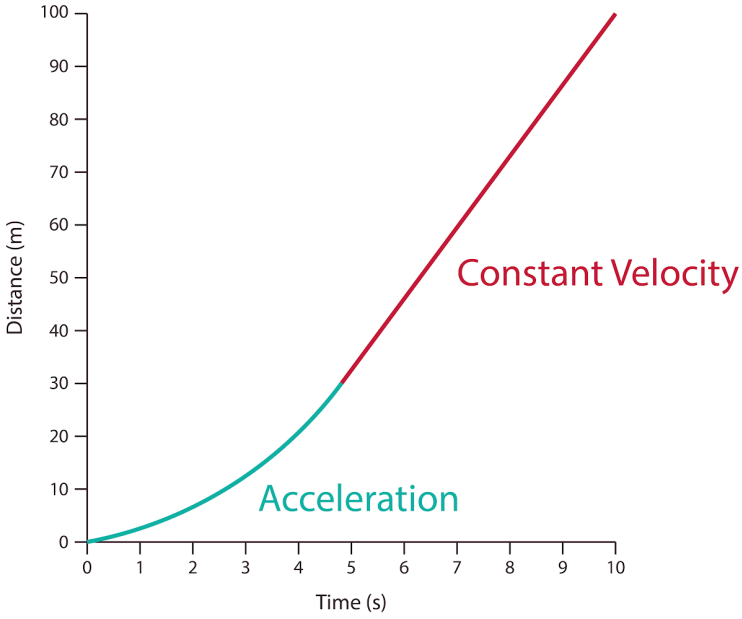
Distance-time Graph for an Amateur Sprinter



Notes

Notes

Distance-time Graph for an Elite Sprinter

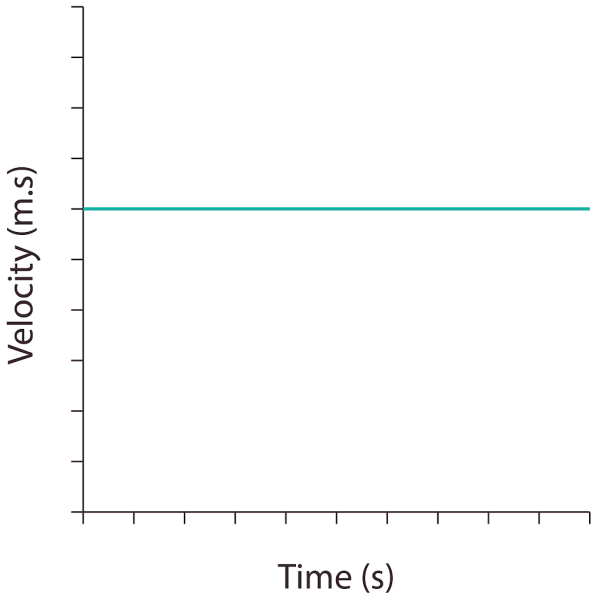


Task:

Sketch a distance time graph for a 400m runner.

Choose one of the following tactics:

1. Runs a consistent split time.
2. Runs a first fast 250m and tries to hang on as they fatigue down the home straight.
3. Runs a steady first 250m and hits top speed for the last 150m.



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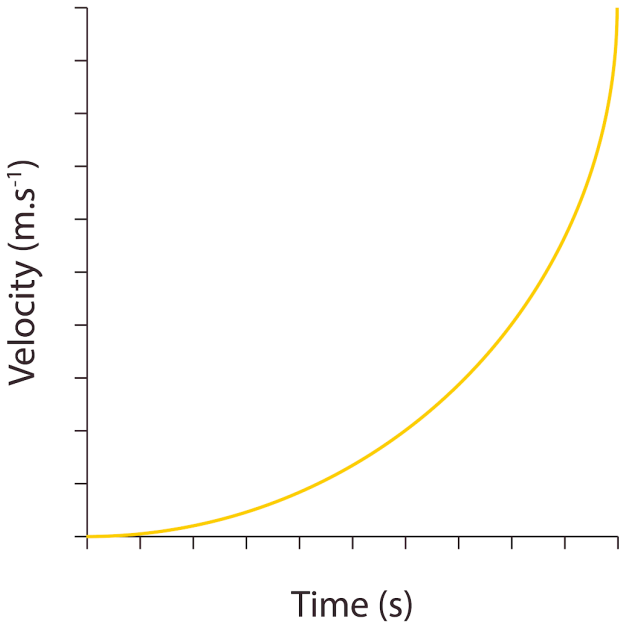

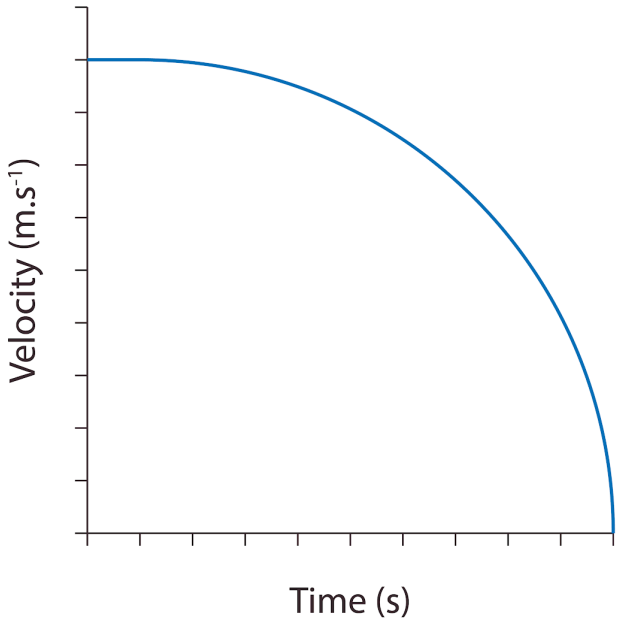
Velocity (m.s-1)
Time (s)

Notes

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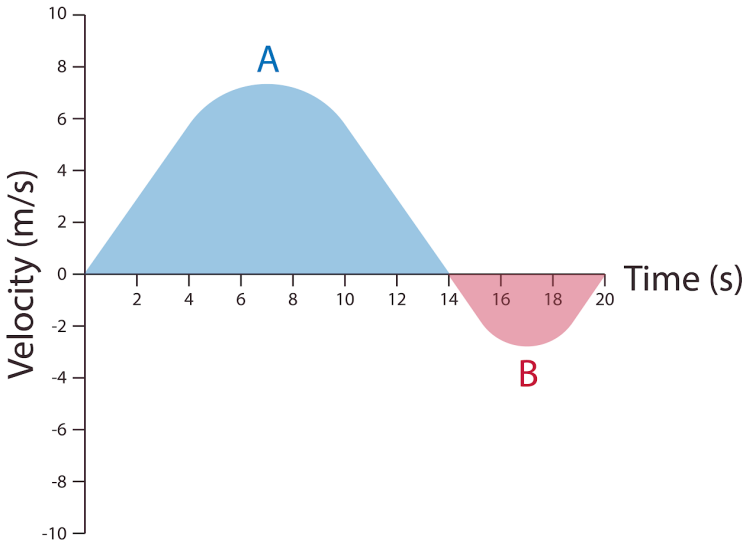
10
8
6
4
2
0
-2
-4
-6
-8
-10
Velocity (m/s)
A
B
2
4
6
8
10
12
14
16
18
20
Time (s)

Section 10: Fluid mechanics

Factors affecting air resistance/drag

Notes

Section 11: Downwards lift force

We must understand Bernoulli's principle to be able to apply this topic:

In fluids (including gases), speed of movement and pressure are inversely proportional.