LEVEL 3 BTEC SPORT (DIPLOMA)

YEAR 1						
	Term 1		Term 2		Term 3	
Unit Title	Unit 1: Anatomy and Physiology					Unit 2: Fitness Training and Programming for Health, Sport and Well-being
Approximate Number of Lessons	8	8	8	6	8	8
Curriculum Content	Learning aim A: The effects of exercise and sports performance on the skeletal system.	Learning aim B: The effects of exercise and sports performance on the muscular system.	Learning aim C: The effects of exercise and sports performance on the respiratory system. Learning aim E: The effects of exercise and sports performance on the energy systems.	Learning aim D: The effects of exercise and sports performance on the cardiovascular system.	Revision and exam preparation	Learning aim A: Examine lifestyle factors and their effects on health and well-being.
Links to prior learning	Links to unit 1 and Unit 3 at BTEC Sport Level 1/2 .					Links to Unit 1 (Level 3)
Cultural Capital Opportunities	Keeping up to date with current sporting events. YouTube: Fittest on Earth – a decade of fitness. Read 'How the body works: The Facts Simply Explained'					Read 'The Science of Fitness'
Assessment Focus	End of unit skeletal assessment.	End of unit skeletal and muscular assessment	End of unit skeletal, muscular, respiratory and energy systems assessment	End of unit skeletal, muscular, respiratory, cardiovascular and energy systems assessment	External exam – May/June	Internal assessment
Name of Knowledge Organiser	Unit 1: Anatomy and physiology knowledge organiser. Pages 63-69 in the specification.					Unit 2 knowledge organiser. Page 31-37 in the specification.

Unit Title	Unit 5: Application of Fitness Testing		
Approximate Number of Lessons	16	14	14
Curriculum Content	Learning aim A: Understanding the principles of fitness testing	Learning aim B: Explore fitness tests and different components of fitness.	Learning aim C: Undertake evaluation and feedback of fitness test results.
Links to prior learning	Level 1/2 BTEC Sport – Unit 1 and 3		
Cultural Capital Opportunities	Keeping up to date with current sporting events. YouTube: Fittest on Earth – a decade of fitness. Attend a local sports clubs (speak to your teachers for advice). Read 'The Science of Fitness'		
Assessment Focus	Written report on the principles of fitness testing. Presentation justifying the selection of fitness tests.	A report interpreting fitness test results.	Written fitness profile with recommendations for improvement.
Name of Knowledge Organiser	Page 61-67 om the specification		

Unit Title	Unit 22: Investigating Business in the Sport and Active Leisure Industry.	Unit 4: Sports Leadership		
Approximate Number of Lessons	16	7	7	14
Curriculum Content	Learning Aim A: Features of sport and active leisure businesses. Learning Aim B: Business models used in the sport and active leisure industry. Learning Aim C: Human resources in the Sport and Active Leisure Industry.	Learning Aim A: Understanding the roles, qualities and characteristics of an effective Sports leader.	Learning Aim B: Examining the importance of psychological factors and their link with effective leadership.	Learning aim C: Explore an effective leadership style when leading a team during sport and exercise activities.
Links to prior learning	Links to data analysis from other subjects	Links to unit 3 & 4 in Level 1/2 BTEC Sport Links to GCSE PE.		
Cultural Capital Opportunities	Keeping up to date with the current trends in the Sports industry. Read: Legacy Sport: How to Win at the Business of Sport in the Age of Social Good.	Read: The Making of a Leader. What Elite Sport Can Teach Us About Leadership, Management and Performance Alex Furguson. My Autobiography.		
Assessment Focus	External set task - Jan	Written sport		Practical delivery. Written review.
Name of Knowledge Organiser	Unit 22: Investigating Business in the Sport and Active Leisure Industry Knowledge Organiser. Pages 179-186 in the specification.	Pages 51-56 in the specification.		

Unit Title	Unit 22: Investigating Business in the Sport and Active Leisure Industry.	Unit 7: Practical Sports Performance.		
Approximate Number of Lessons	16	14	7	7
Curriculum Content	Learning Aim D: Marketing in the Sport and Active Leisure Industry. Learning Aim E: Finance in the Sport and Active Leisure industry. Learning Aim F: Trends in the Sport and Active Leisure Industry.	Learning Aim A: Examine National Governing Body rules/laws and regulations for selected sports competitions. Learning Aim B: Examine the skills, techniques and tactics required to perform in selected sports.	Learning aim C: Develop skills, techniques and tactics for sporting activity in order to meet sport aims.	Learning aim D: Reflect on own practical performance using selected methods.
Links to prior learning	Links to data analysis from other subjects	Unit 2 from Level 1/2 BTEC Sport		
Cultural Capital Opportunities	Keeping up to date with the current trends in the Sports industry. Read: Legacy Sport: How to Win at the Business of Sport in the Age of Social Good.	Participate in activities run by local sports clubs. Read “An introduction to performance Analysis of Sport.”		
Assessment Focus	External set task – Jan	Written report.	Practical videos and log.	Written reflective report on personal performance.
Name of Knowledge Organiser	Unit 22: Investigating Business in the Sport and Active Leisure Industry Knowledge Organiser. Pages 179-186 in the specification.	Pages 81-85 in the specification.		

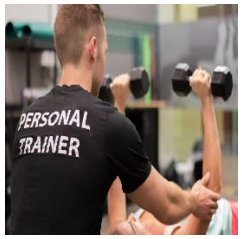
YEAR 2						
	Term 1		**Term 2**		**Term 3**	
Unit Title	Unit 2: Fitness Training and Programming for Health, Sport and Well-being		Unit 3: Professional Development in the Sports Industry.			
Approximate Number of Lessons	8	8	8	6	8	8
Curriculum Content	Learning aim B: Understand the screening process for training programming. Learning aim C: Understand programme-related nutritional needs	Learning aim D: Examine training methods for different components of fitness. Learning aim E: Understand training programme design.	Learning aim A: Understand the career and job opportunities in the sports industry.	Learning aim B: Explore own skills using a skills audit to inform a career development action plan.	Learning aim C: Undertake a recruitment activity to demonstrate the processes that can lead to a successful job offer in a selected career pathway.	Learning aim D: Reflect on the recruitment and selection process and your individual performance.
Links to prior learning	Links to unit 1 and Unit 5.		Links to Unit 5 studied in year 1.			
Cultural Capital Opportunities	Keeping up to date with government recommendations. Keeping up to date with socioeconomic factors.		Keeping up to date with available jobs. Keeping up to date with gaps in the jobs market.			
Assessment Focus	Set Task - Jan		Written report.	Career development action plan.	Interview and recruitment activities.	SWOT analysis and report.
Name of Knowledge Organiser	Unit 2 knowledge organiser. Page 31-37 in the specification.		Pages 41-47 in the specification.			

Unit Title	Unit 25: Rules, Regulations and Officiating in Sport.		
Approximate Number of Lessons	16	14	14
Curriculum Content	Learning aim A: Understand the development of the roles and responsibilities of the officials involved in sport.	Learning aim B: Explore the performance of officials in a selected sport.	Learning aim C: Undertake the role of a match official in a competitive sport.
Links to prior learning	Unit 1 and Unit 5 from year 1 of the course.		
Cultural Capital Opportunities	Keeping up to date with current sporting events and rule developments. Watching competitive sporting events. Read 'Blowing The Whistle: The Psychology of football refereeing" Read "Whistle Blower: My Autobiography"		
Assessment Focus	Written report on the development of rules and regulations over time.	Scenario based written report.	Practical performance with a written reflection.
Name of Knowledge Organiser	Page 209-213 om the specification		

Unit Title	Unit 23: Skill Acquisition in Sport		
Approximate Number of Lessons	16	14	14
Curriculum Content	Learning aim A: Investigating the nature of skilled performance. Learning aim B: Examine ways that sport performers process information for skilled performance.	Learning aim C: Explore theories of teaching and learning in Sport.	Learning aim D: Carry out teaching and learning strategies for sports skills.
Links to prior learning	Links to unit 2 and Unit 4 for year 1 of the course.		
Cultural Capital Opportunities	Keeping up to date with current sporting events. Read 'The Science of Fitness'		
Assessment Focus	Written report on the criteria of a skilled performer linked to the information processing model.	A PowerPoint presentation	Practical delivery of a session with a detailed review.
Name of Knowledge Organiser	Page 61-67 om the specification		

Unit 22 Investigating Business in Sport and the Active Leisure Industry

Learning Aim A: Features of sports and active leisure businesses (business operations) Term 1



Types of sport and active leisure businesses

Privately owned businesses – not owned by local or national governments, but are owned by an individual person or group of people.
Sole trader- trades as an individual offering a service or selling products
Partnership – two or more people come together to run a business
Private limited companies – smaller business organised with shareholders
Public limited companies (PLC's) – these companies tend to be larger businesses with shares offered to the public
Co-operatives – this is a business owned and run by its members
Public bodies – sometimes called quangos these are set up and funded by the government.
Voluntary sector – charitable trusts run for public good in areas such as public health and education.

Scope and size of business

Scope is the extent of the business's activities
Local – based around local area, likely to be a sole trader, partnership or private limited company
National – operates throughout country, unlikely to be a sole trader or partnership
International – trades across international borders
Multi-national – this type of business has assets and activities in multiple countries

Size refers to the total number of employees

Micro – up to 9

Small – 10-49

Medium – 50-249

Large – 250+

Aims and objectives of sport and active leisure businesses

Best objectives are SMART (Specific, Measurable, Achievable, Realistic, Time-constrained)

Private sector – aim is to make money.
Key terms: Making profits, Break-even, Survival, Growth, Market leadership, Diversification, Service provision and Strong customer service/satisfaction

Public Sector – run by national and local governments
Key terms: Cost control, Value for money, service quality and Meeting government standards

Voluntary sector – aim is to support local communities and encourage participation

Key terms/command words for unit

A**nalyse** – to examine in detail in order to discover the meaning and features of a theme, topic or situation. To break something down into its components, and say how they are related and explain how each one contributes to the topic.
Business models – both must be understood. SWOT (strengths, weaknesses, opportunities, threats) PESTLE (political, economic, social, technological, legal, environmental).
Interpretation – to draw the meaning, purpose or qualities of something from a given stimulus
Justification – to give reasons or evidence to support an opinion or decision and prove something right or reasonable.
Research – to carry out careful study and gather information about a topic
Review – a process for learning (knowledge or skills)

Provision of sports facilities, programmes and services (Term 1)

In the public sector this is funded by local and national government. This is seen in the provision of large multi-use facilities such as leisure centres.

In the private sector these are funded by private companies, such as health and fitness clubs.

Programmes to promote participation

Individual training – takes place in public and private sectors
Group exercise activities – occur in both public and private sectors
Water-based activities – occur in both sectors, but rely on a swimming pool
Educational/school programmes - Sport programmes, gym programmes, swimming programmes, programmes to match demand and programmes to serve specific groups.

Customer groups

Businesses put customers into distinct customer groups:

Customer groups by demographic
Age classification
Gender
Ethnic minority grouping
Disability
Socio-economic group

Customer group by purpose
Specific activity or sport
Recreational
Weight loss
Personal image
Health maintenance
Training for performance
Charitable

Programming to meet the needs of customers

Once the business knows the customer group they can put together a programme to meet their needs.

To achieve this they must consider carefully the following three areas:

Provision – appropriate facilities

Staffing – right number and qualified staff

Legal requirements – staff must be DBS checked, especially if working with children.

Health and Safety protocols must be adhered to and risk assessments completed

Governing body requirements must be met

Employees must receive the relevant minimum wage

Key terms

Multi-use facilities – leisure centres incorporating additional facilities such as outdoor pitches and swimming pools.

Members-only clubs – private or fee paying clubs that offer leisure or sports facilities for the exclusive use of members.

National Health Service (NHS) – the collective term for health services in England, Wales and Scotland.

General Practitioner (GP) – a doctor who treats a range of illnesses and provides preventative care for patients at a designated surgery.

Stakeholders and their influence & Relevant laws, legislation and safeguarding issues (Term 1)

Stakeholders and their influence on sports and active leisure businesses

Two types: internal (those within the business) and external (those outside the business)

Examples of each:

Internal: Managers, employees and owners/shareholders

External: Suppliers, Competitors, Creditors, Customers, Government agencies and departments, Communities, Interest groups, Trade associations and Fundraisers.

Laws, legislation and safeguarding relevant to the sport and active leisure industry

This will cover the current and relevant legal and legislative requirements covering safeguarding, employment and equality and diversity, and how they are used in the sport and active leisure industry.

Any business must meets these standards and expectations in order to operate.

Legislation covered:

Data Protection Act (UK 1988)

Disability Discrimination Act (UK 1995 & 2002)

Sex Discrimination Act (1975)

Race Relations Act (1976)

Business models in sport and active leisure (Term 2)

These are strategic plans for the operation of a business to aid decision making.

Business models

These models help to identify customer bases, products to sell, sources of revenue and good financial management.

There are two common analysis tools used to help businesses work out where they are now and where they want to go.

These are known as

SWOT and PESTLE

SWOT

Used to evaluate the strengths, weaknesses, opportunities and threats that face a business.

Strengths – what does the business offer that is out of the ordinary?

Weaknesses – what does the business require in order to be successful?

Opportunities – is there an existing or potential new market available?

Threats – competition from competitors, is local competition going to have an impact on the business plan?

PESTLE

This looks at factors that influence a business environment.

Political – political situation in host country.

Economic – considers components of an economy.

Social – examines the culture and demographic of a nation or region.

Technological – how to incorporate the ever changing technology into a business.

Legal – aware of legal framework and legal requirements.

Environmental – impact of geographical location, weather and climate on components of a business.

Key terms

Bespoke – written or adapted for a specific participant or purpose.

Inflation – the rate at which the cost of goods and services rise.

Interest rates – the amount of a loan that is charged to a borrower.

Foreign exchange rates – the rate at which one currency is exchanged for another, such as British Pound (£) to US Dollars ($).

Globalisation – when businesses and organisations develop international operations and influence.

Human resources (Term 2)

Job roles and person specifications

Staff are described as the key element in any business, especially true in sport and active leisure industry.

Staff must be well qualified and able to deliver good customer service.

Common job roles in the industry:

Executive/owner/manager

Supervisor

Qualified sports leader, instructor or coach

Support staff (admin, security, cleaning staff and IT staff

Trainee

Volunteer

Types of employment

The way a business hires staff will be dictated by the nature of the business.

Full-time staff
Part-time staff
Seasonal roles
Consultant
Volunteers
Franchisees

Benefits and risks of different types of employment

Hours of operation
Sick leave, annual leave and pension contributions
Is the business seasonal?
To address specific weaknesses or needs

Human resource management

Human resources (HR) is essential and has a number of roles and responsibilities:
Timetabling of staff
Salaries

Physical resource management

Sport and active leisure businesses need a huge range of physical resources on a daily basis. These must not run out.
Resource planning: supplies and materials, contracting, changes in staffing needs, events and foreseen risk control
Resource maintenance: emergency cover, health and safety, assets, leasing options, maintenance and refurbishment and budgetary restraints.

Importance of resource management

Maximising skills, productivity and capacity

Reducing risk, costs and wastage

Key terms

Pension – a tax-efficient method of saving during working life to provide an income once retired.

Capacity – the output or performance that a business can provide in a given timeframe.
Assets – property or equipment owned by a business or organisation with a specific value.
Cash flow – the amount of money flowing in to and out of a business or organisation.
Productivity – the economic measure of a business's potential output.
Wastage – service or stock that are not used to their potential resulting in a monetary loss to the business

Marketing (Term 3)

Marketing

The process that sport and active leisure businesses use to market their products to reach their customers and meet their needs and expectations.

7 P's of marketing
Product
Price
Promotion
Place
People
Process
Physical environment

Meeting the needs of the customer

Who are the customers and what are their needs?

Being knowledgeable about services, equipment, activities and facilities.
Customer knowledge
Competitors
Market
Demands and trends
Opportunities
Pricing
Highlighting benefits for the customer of promotions (special offers, customer loyalty schemes)

Taking the initiative in communicating with customers
Ways of communicating with customers:
Verbal
Non-verbal
Listening
Responding to complaints
Recognising if customers have special requirements

Key terms

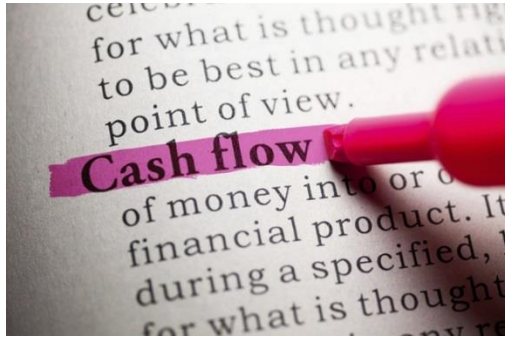
Product life cycle – the stages a product goes through from initial idea, through usage, to it being withdrawn from the market.

Unique selling point (USP) – something that makes a business or its product different to anything else.

Logistics – the coordination, movement and storage of products or services.

AIDA – Awareness, Interest, Desire and Action: a model used to describe the steps involved when a customer engages with a new business or organisation.

Finance and trends in the sport and active leisure industry (Term 3-4)



Financing a business in sport and active leisure

The ability to review financial statements and assess budgeted figures to determine if a business is developing, improving or making a profit.

Content and purpose of cash flow

Fixed and variable costs of a business

Capital costs and operational costs

Equipment costs, including upgrading equipment

Financial records

All businesses are subject to audits, where all financial records are checked.

It is a legal requirement to keep financial records for:

All sales and income

All business expenses

VAT records

PAYE records

Trends in the sport and active leisure industry

Essential to keep an eye on activities and services that are increasing in popularity. Also be aware of those that are on the decline.

Factors affecting these trends:

New technologies

Influence of the media, including social media

Changes in national participation rates for different activities

Changes in participation and spectator numbers

Key terms

Cash flow – the total amount of money flowing into and out of a business.

Corporation tax – the tax levied on companies' income and profits.

National Insurance – a contribution from a person's income towards nationally distributed benefits (state pension and maternity allowance).

Components of fitness

Physical fitness

- Aerobic endurance
- Strength
- Muscular Endurance
- Flexibility
- Speed
- Body composition

Skill related Fitness

- Agility
- Balance
- Coordination
- Reaction Time
- Power

Flexibility Training Methods

- Static (Active/passive)
- Dynamic
- Proprioceptive neuromuscular Facilitation (PNF)

Core Stability Training Methods

- Yoga
- Pilates

Agility Training Methods

- SAQ

Aerobic Endurance Training Methods

- Continuous
- Fartlek
- Interval
- Circuit Training

Muscular Strength Training Methods

- Resistance Machines
- Free weights
- Medicine ball
- Circuit Training
- Core stability

(Pyramid Sets)

Muscular Endurance Training Methods

- Circuit
- Resistance Machines
- Free Weights
- Resistance Bands

Speed Training Methods

- Hollow Sprints
- Acceleration Sprints
- Interval Training
- Resistance drills

Balance Training Methods

- Static Balance
- Dynamic Balance

Coordination Training Methods

- Sport Specific

Reaction Time Training Methods

- Using a stimulus

Power Training Methods

- Plyometrics

Training Zones

Anaerobic Threshold
80-100%

Peak Performance
80-90%

Aerobic
60-80%

Fat Burning
60-70%

Sets, Reps, Resistance, Rest

Weight Training

Muscular Strength

Exercise	Reps	Sets	Weight	Rest
Bench Press	8	6	75% 1 rep max	3 mins

Muscular Endurance

Exercise	Reps	Sets	Weight	Rest
Bench Press	15	4	50% 1 rep max	30 secs

Interval Training

Aerobic (Endurance)

Time	Sets	Reps	Work/Rest	Relief
3-5 mins	1	4	1:1	Walk

Lactate System

Time	Sets	Reps	Work/Rest	Relief
30-80 secs	3-5	5	1:3	Jog

ATP-PC

Time	Sets	Reps	Work/Rest	Relief
10- 20 secs	5	10	1:3	Walk

Flexibility

Notes	Equipment
• Maintenance Stretches • Developmental stretches • Pre-Activity stretches **Static** (active & passive) **Dynamic**	• Towel • Belt • Mat • Partner

Plyometrics & SAQ

Notes	Equipment
Plyometrics involves an eccentric muscle contraction followed by a powerful concentric muscular contraction	• Ladders/cones • Jump Ropes • Hurdles • Benches

Speed

Equipment

- Resistance Bands
- Bungee Rope
- Parachutes
- Resistance Tyres

Yoga

Exercises

- Side plank
- locust
- Boat
- Dolphin

Coordination

Exercises

- Ball catching
- Juggling Drills

Exercise & Physical Activity

Physical Benefits

- Strengthens Bones
- Improves Posture
- Improves Body Shape
- Reduces Risk of Chronic Diseases

(Cancer, CHD, Type 2 Diabetes)

Social Benefits

- Encourages Social interaction
- Improves Social Skills
- Reduces Isolation
- Improves self-esteem & Confidence

Economic Benefits

- Reduces NHS Costs
- Creates Employment
- Supports Local Businesses
- Reduces Absenteeism at Work

Psychological Benefits

- Relieves Stress
- Reduces depression
- Improves Mood

Exercise Recommendations

Children aged 5-18: 60 minutes every day, 3 days should improve strength

Adults: Active daily and do at least 150 minutes aerobic activity per week, 2 days improving strength

Balanced Diet

Correct nutrients in the right quantities

Benefits

- Improved Immune System
- Maintain healthy weight
- Reduced Risk of Chronic Disease

Fluid Intake

- Water Intake = 2 - 2.5 litres per day
- Water Main Transport System Around the Body
- Regulates Temperature

Caffeine Intake

- Caffeine is a Mild Stimulant
- Too Much Caffeine Can Lead to Physiological Side Effects Such as: Hypertension & Digestive Problems

Calorie Intake:

Men =2500

Women 2000

Recommended Caffeine Intake:

400mg = 4-5 Cups of Coffee

Negative Lifestyle Factors on Health & Well-Being

Smoking	Alcohol	Stress
• Coronary Heart disease • Lung & Mouth Cancer • Lung Disease • Emphysema • Bronchitis • Infertility	• Stroke • Liver Cirrhosis • Hypertension • Depression • Brain damage • Kidney Disease	• Hypertension • Angina • Stroke • Heart Attack • Stomach Ulcers • Depression

Sedentary Lifestyle	Lack of Sleep
Less than 30 minutes of exercise per week, can lead to: CHD, Stoke, Type 2 Diabetes, Cancers and Hypertension	Sleep allows your body tom restore itself, lack of sleep and insomnia is linked to: Heart Disease, Depression and Overeating

Modification Techniques

Physical Activity

Home
- Walking
- Housework/Gardening
- Standing Up More

Work
- Stairs not Lift
- Lunch Time Activity

Leisure Time
- Join Gym/Club
- Family Outings

Transport
- Walk/Cycle (Pedometer)

Alcohol

- Self Help Groups
- Lower Alcohol Intake
- Counselling
- Alternative Therapy

Stress

- Assertiveness Training
- Goal Setting
- Time Management
- Physical Activity
- Positive Self-Talk
- Relaxation - Breathing techniques & Meditation
- Alternative Therapies Such as Counselling or Medication
- Work Life Balance

Barriers to Change:

- Time
- Money
- Transport
- Location

Diet

- Eatwell Guide
- Timing of Meals
- Food Choice
- Portion Sizes
- Five a Day
- Reduce Salt Intake
- Heathy Alternatives

Smoking

- Acupuncture
- NHS Help line/Services
- Nicotine Replacement Therapy
- Electronic Cigarettes

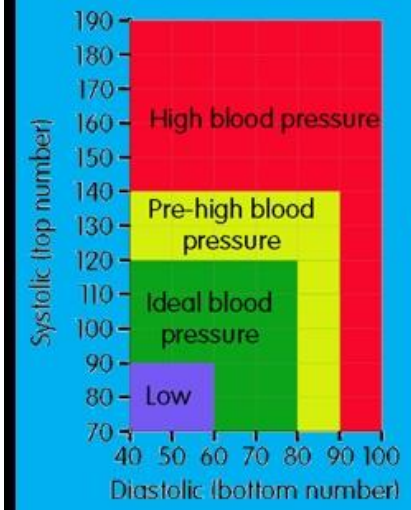
Alcohol Intake:

14 Units a Week

2/3 Alcohol Free Days

Health Monitoring Tests

Blood Pressure



Men's Resting Heart Rate Ranges						
Age	18-25	26-35	36-45	46-55	56-65	65+
Athlete	49-55	49-54	50-56	50-57	51-56	50-55
Excellent	56-61	55-61	57-62	58-63	57-61	56-61
Good	62-65	62-65	63-66	64-67	62-67	62-65
Above Average	66-69	66-70	67-70	68-71	68-71	66-69
Average	70-73	71-74	71-75	72-76	72-75	70-73
Below Average	74-81	75-81	76-82	77-83	76-81	74-79
Poor	82+	82+	83+	84+	82+	80+

Women's Resting Heart Rate Ranges						
Age	18-25	26-35	36-45	46-55	56-65	65+
Athlete	54-60	54-59	54-59	54-60	54-59	54-59
Excellent	61-65	60-64	60-64	61-65	60-64	60-64
Good	66-69	62-68	65-69	66-69	65-68	65-68
Above Average	70-73	69-72	70-73	70-73	69-73	69-73
Average	74-78	73-76	74-78	74-77	74-77	74-77
Below Average	79-84	77-82	79-84	78-83	78-83	78-83
Poor	85+	83+	85+	84+	84+	84+

Blood Pressure Prevention

- Eat less salt
- Eat more Fruit & veg
- Maintain healthy Weight
- Exercise
- Reduce caffeine intake

Waist to Hip Ratio

Can determine levels of obesity
Divide waist in cm by Hips in cm
Accepted health Ranges
1.0 for Men
0.85 for Women

BMI Health Ranges

<18.5 – Underweight
18.5 – 24.9 – Healthy Range
25 – 30 – Above Healthy Range (May be Overweight)
>30 – Classed as Being Obese (Risk of Stroke, CHD, Type 2 Diabetes)

BMI

- Measure weight in kg and height in m
- Divide the weight by their height
- Divide the answer by their height again

Macronutrients

Carbohydrates are your bodies most readily available energy source, stored in the muscle and liver as glycogen
Simple (Sugar, Jam, Honey, Sweets, Fizzy Drinks)
Complex (Pasta, Rice, Potatoes, Bread, Noodles)
50-60% of total calories = complex carbohydrates

Fats used for energy, insulation and buoyancy, cell membranes, absorbing certain vitamins
Saturated (Lard, Butter, Meat, Cream)
Monounsaturated fats (Olive Oil, Peanuts)
Polyunsaturated (Margarine, Sunflower Oil, Oily Fish)
25-35% of total calories = fats (Men 30g Women 20g)

Proteins are used for growth and repair, Amino acids are the smallest unit of protein, can provide energy
Foods that contain all **Essential Amino Acids (EAA's)** are called **Complete proteins** = Eggs, Meat, Fish, Milk
Incomplete proteins are those that lack more than one EAA's = Cereals, Rice, Bread, Pasta)
Men = 30g a day Women = 20g per day

Micronutrients

Vitamins
Vitamin A – Function of Eyes and Respiratory Tract (green veg)
Vitamin B – Releases Energy from food (lean meat, eggs)
Vitamin C – Essential for Healthy Skin, Bone, Tissue (citrus fruit & veg)
Vitamin D – Healthy Bones as it Absorbs Calcium (fish, Eggs)

Minerals
Calcium – Bones and teeth (dairy products meat, veg, fish, nuts)
Iron – Component of Haemoglobin in the Blood (red meat, dried fruit)

Terminology

RDA= Found on labels a good guide
Colour Coding =Found on labels
EAR = Estimated Average requirement
LRNI = Lower Reference Nutritional Intake
SI = Safe Intake
Energy Balance
BMR = Basal Metabolic Rate

Hydration is affected by:
Climate, Exercise, Time of Year
Dehydration Can cause:
Nausea, Headaches, Dizzy, Lack of Energy, Hot, Short of Breath
Hyperhydration Can Cause:
Low Sodium Levels (Hyponatremia)

Ergogenic Aids:
Energy Gels and Bars
Protein Drinks
Carbohydrate loading
Optimum Weight:
Adapt diet to gain or lose weight

Sports Drinks:
Isotonic: During Exercise (4-8%)
Hypertonic: After Exercise (more than 8%)
Hypotonic: During Exercise (less than 4%

Aims Objectives & SMARTER Targets

Goal Setting

- Gives an aim and a focus
- Increases motivation
- Improve confidence
- Less likely to get bored

Aims

- What you hope to achieve, apply the:

SMARTER Principle

S = Specific

M = Measurable

A = Achievable

R = Realistic

T = Time Phased

E = Exciting

R = Recorded

Principles of Training

- **FITT**
  Frequency (How Often)
  Intensity (How Hard)
  Time (How Long)
  Type (Type of Training)
- **Specificity** – matches the sport
- **Overload** – Working harder than normal
- **Progression** – Gradually make training harder
- **Reversibility** – Fitness deteriorates
- **Adaptation** – The body programmes the muscle to remember
- **Variation** – Vary training to prevent boredom
- **Individual Needs** – Training has to be personal (age, fitness, skill, gender)
- **Rest & Recovery** – Essential to adapt and recover the muscles

Periodisation

Macrocycles (1 – 4 Years)
Mesocycles (Monthly)
Microcycles (Weekly)

F.I.T.T. Principle (Examples)

Muscular Endurance	Muscular Strength	Power
F = Beginner 2-3 days per week. Advanced 4-5 days per week **I** = Many repetitions light weight 15-30 reps 40-50% of 1RM **T** = 30-60 min session **T** = Weight training/circuit training etc...	**F** = 3-4 days per week **I** = Low repetitions heavy weight 6-8 reps 70-80% of 1RM **T** = 30-60 min session **T** = Free weights, resistance machines, circuit training, etc...	**F** = 2-3 sessions per week **I** = 100% effort. The greater the intensity less reps more rest **T** = Each set no longer than 6-8 seconds **T** = Plyometrics

Points to Remember

Consider:

The sport/fitness levels

What performer likes/dislikes

Availability of equipment/finances

Training is varied to maintain interest

Continuous Training

Good for aerobic fitness, lose weight accessible
Boring, not always sport specific

Fartlek Training

Good for team sports, less boredom, easy to use
Too easy to cheat, can be difficult

Circuit Training

Less boring, easily adapted for fitness/sports
Take time to set up, requires equipment

Interval Training

Can be both aerobic and anaerobic,
Can be boring

Free Weights

Full range of sporting movement
Risk of injury, need a spotter

Resistance Machines

Safer, good for beginners
Expensive, no functional

Writing Tick List

Interpreting Lifestyle

- Have you commented on all the highlighted points from the question?
- Have you mentioned Government Recommendations?
- Have you mentioned the positives and negatives of their lifestyle

Lifestyle Modification

- Have you explained and justified the lifestyle modification techniques?
- Have you suggested alternative strategies?
- Have you been relevant to the individual throughout the answer?

Nutritional Guidance

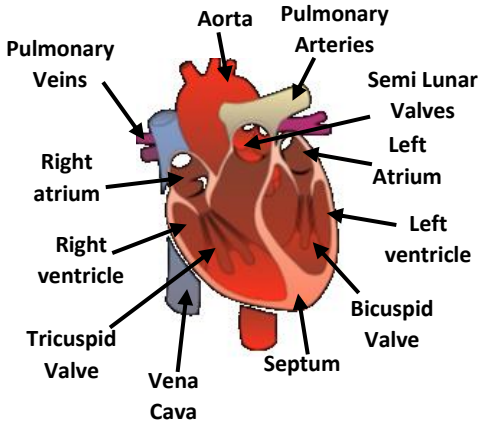
- Have you given specific guidance to the individuals requirements?
- Have you justified your recommendations?
- Have you linked to government recommendations?

Training Methods/Programme

- Have you Followed **all** the principles of training?
- Have you been specific in your choice of training?
- Have you justified your choice of training?
- Have you referred back to the persons individual needs?
- Have you referred to the individuals aim/goal?
- Is training specific to the individuals skill/fitness?
- Have you included detail in the training programme?
  Sets, Reps, Intensity, Target Zones, Rest, Warm-Up, progression, cool down

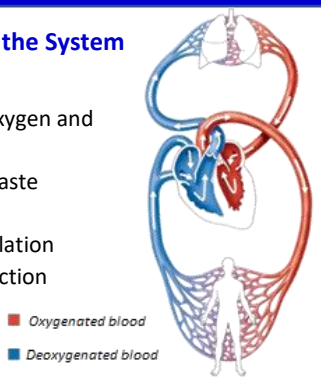
The Cardiovascular System

Structure of the Heart

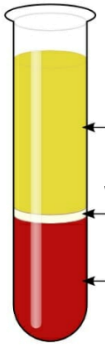


Functions of the System

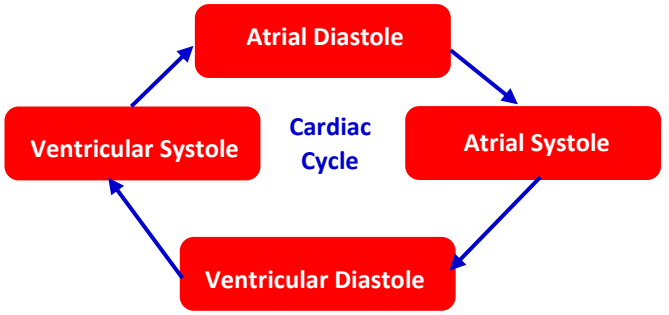
1) Delivering oxygen and nutrients
2) Removing waste products
3) Thermoregulation
4) Fighting infection
5) Clot blood



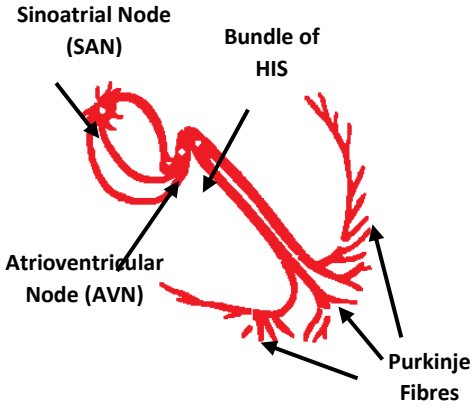
Composition of blood



Cardiac Cycle



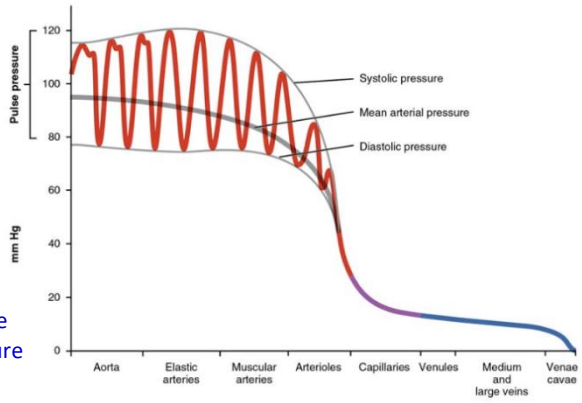
Conduction of the Heart

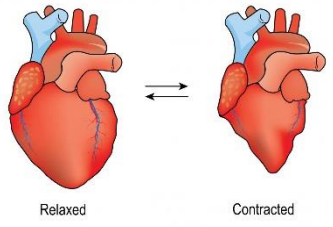


Exercise (Short term)
1) Anticipatory rise
2) Increased heart rate
3) Increased Cardiac output
4) Increased blood pressure
5) redirection of blood

Training (Long Term)
1) Cardiac hypertrophy
2) Decrease in resting heart rate
3) Decrease in resting stroke volume
4) Reduction in resting blood pressure
5) Decreased recovery time
6) Increased blood volume

Blood pressure





Diastolic **Systolic**

Neural control of heart rate

Sympathetic nervous system

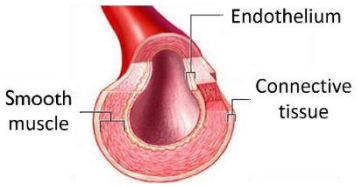
Excites – fight or flight
1) Secretes adrenaline
2) Increases heartrate
3) Increased blood pressure
4) Increases contractibility of the heart
5) Stimulates vasoconstriction/ vasodilation

Parasympathetic nervous system

Calms/relaxes
1) Decrease heart rate
2) Decrease blood pressure
3) Decrease cardiac output (Q)

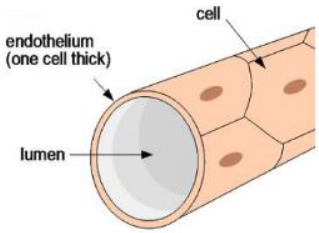
Structure of Blood Vessels

Artery / Arterioles



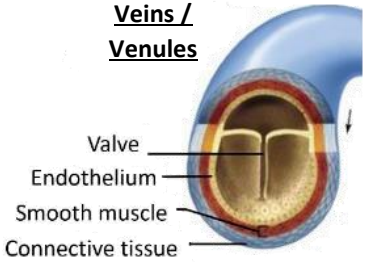
- Takes blood **A**way from the heart (exception the pulmonary artery)
- Oxygenated blood
- Thick elastic walls
- High pressure

Capillary

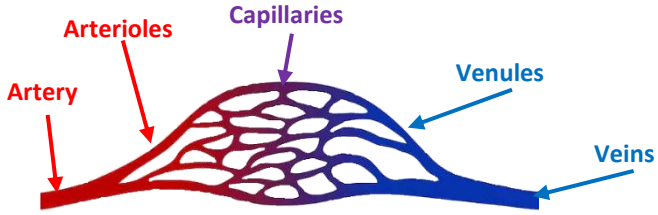


- One cell thick
- Diffusion
- Gaseous exchange (oxygen in CO_2 waste out)

Veins / Venules



- Blood back to the heart
- Deoxygenated blood
- Thin walls
- Large lumen
- Lower pressure
- Valves

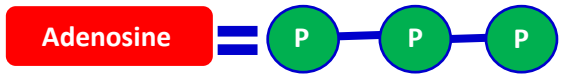


Vasodilation

Vasoconstriction

Energy Systems

Adenosine Triphosphate (ATP)

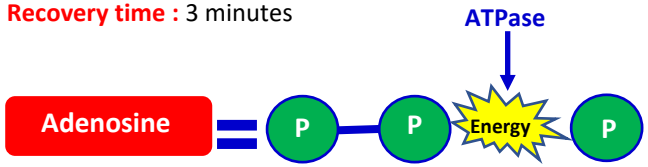


The energy comes from breaking the bonds between each phosphate

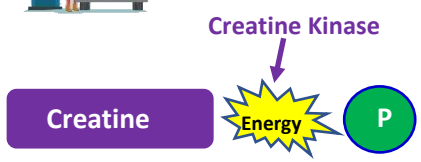
- ATP is the only usable form of energy in the body.
- The body has a store of 3 seconds of ATP.
- Then there are 3 systems that can resynthesise it

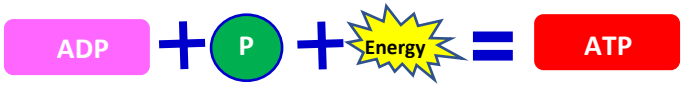
ATP-PC System

Type: Anaerobic
Fuel source : Phosphocreatine (PC)
Duration: 8-10 seconds
Used in : short explosive power
Recovery time : 3 minutes



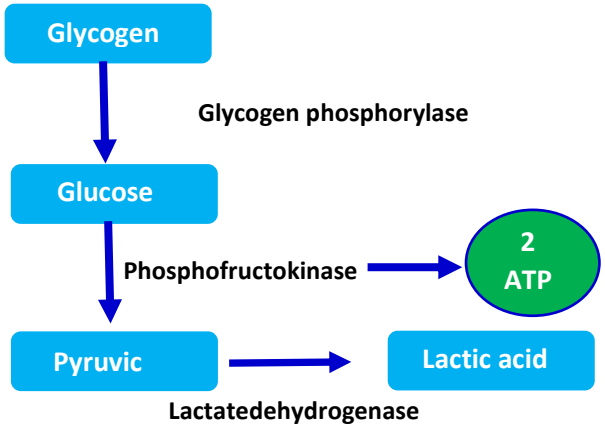
Let's Refuel using Creatine Phosphate





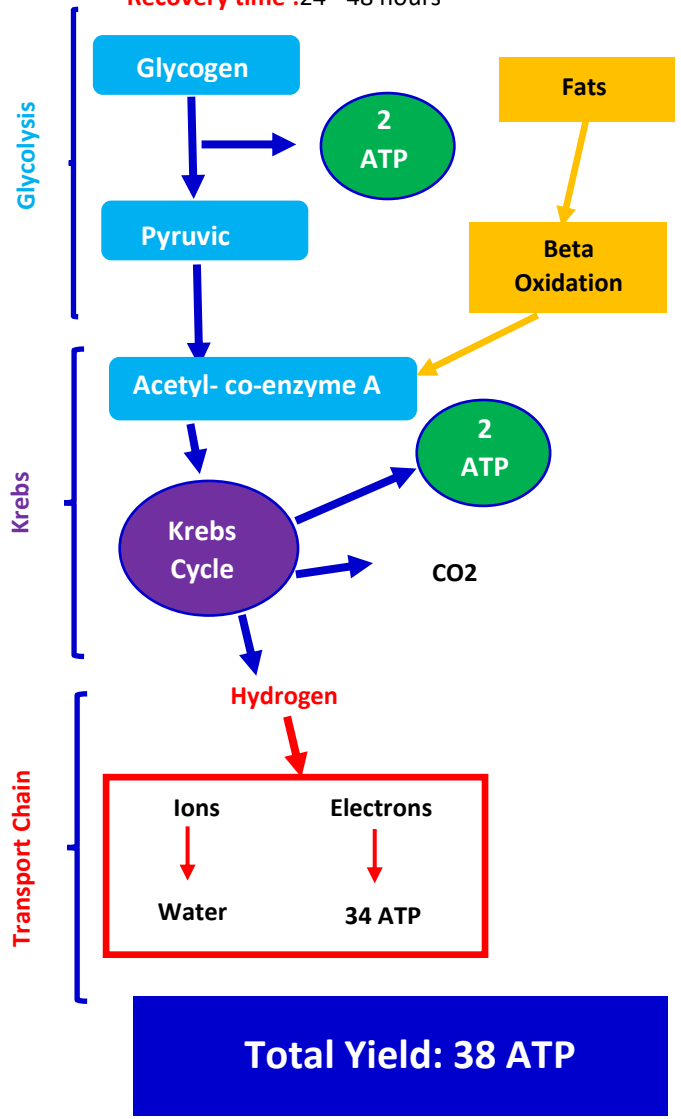
Lactate System

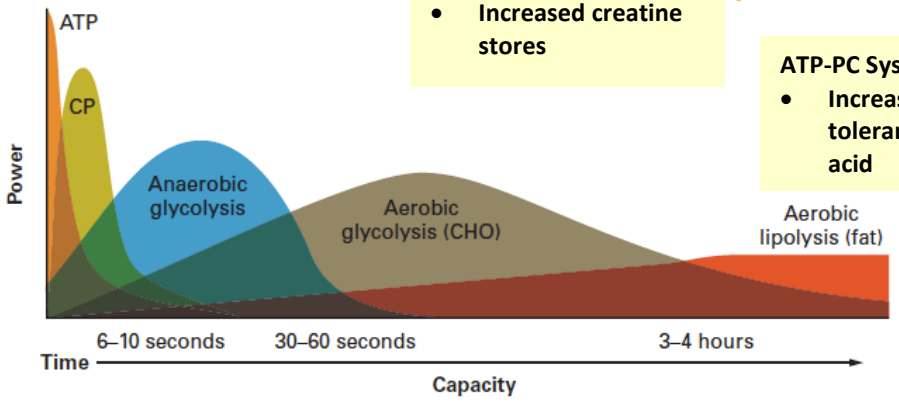
Type: Anaerobic Glycolysis
Fuel source : Glycogen
Duration: 10 secs to 2 mins
Used in : stop start games/ court sports/400m
Recovery time : 1-2 hours



Aerobic System

Type: Aerobic Glycolysis
Fuel source : Glycogen and fat
Duration: Longer than 2 mins
Used in : Long distance and endurance events
Recovery time :24 - 48 hours





Adaptations to Systems Long Term

ATP-PC System
- Increased creatine stores

ATP-PC System
- Increased tolerance to lactic acid

Aerobic System
- Increased use of fats
- Increased storage of glycogen

The Muscular System

Three types of Muscles

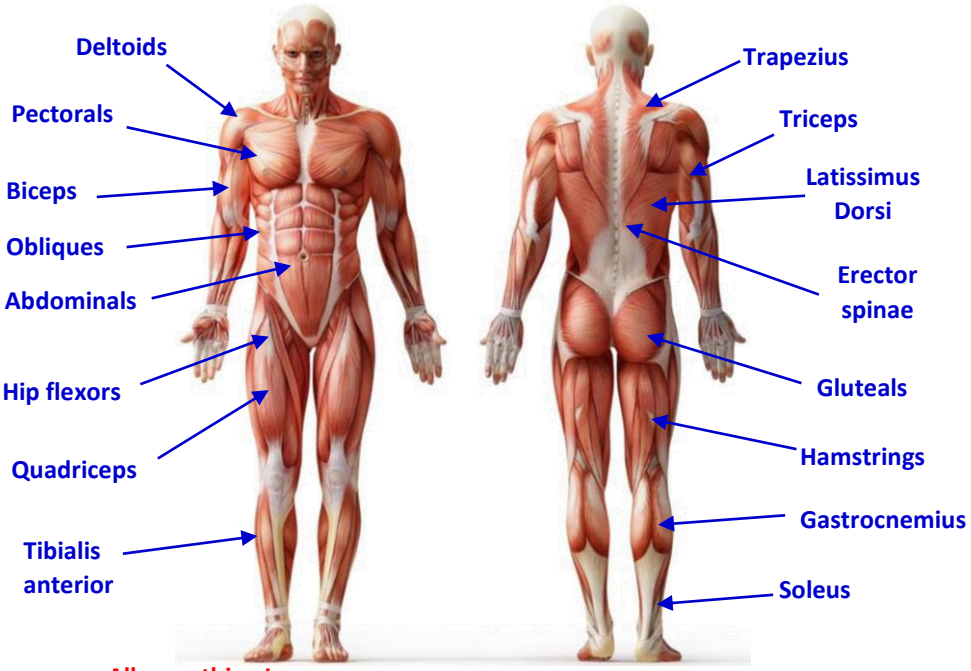
Cardiac, non-fatiguing | Involuntary, slow contraction | Skeletal, fatiguing

Three types of Muscle Contraction

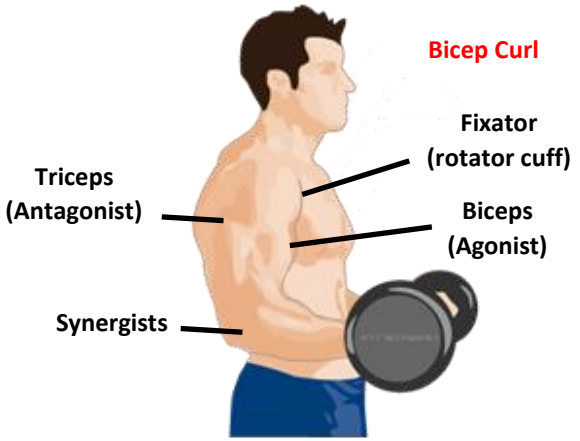
Isometric
Length of muscle does not change

Concentric
Muscle shortens

Eccentric



Antagonistic Pairs



Antagonistic pairs = muscles that work together to produce movement (One muscle contracts whilst the other relaxes

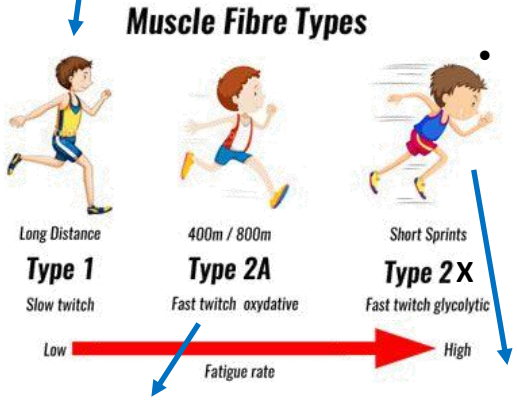
Agonist = muscle shortens to create movement

Antagonist = muscle relaxes during movement

Fixator = stops unwanted movement/stabilises

Synergists = Assists the agonist

- Slow contraction
- Slow to fatigue
- Suited to aerobic activities
- Uses oxygen
- Rich blood supply
- Many mitochondria

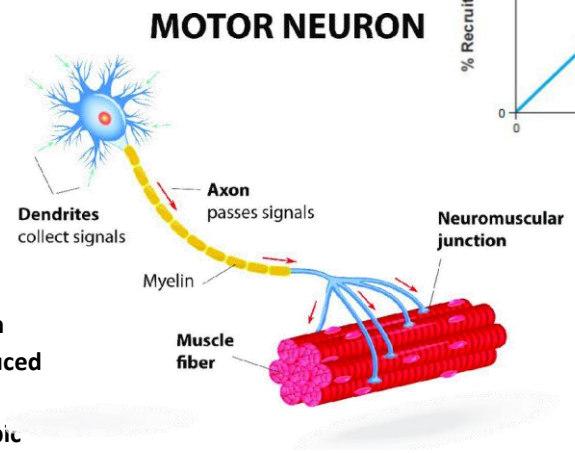


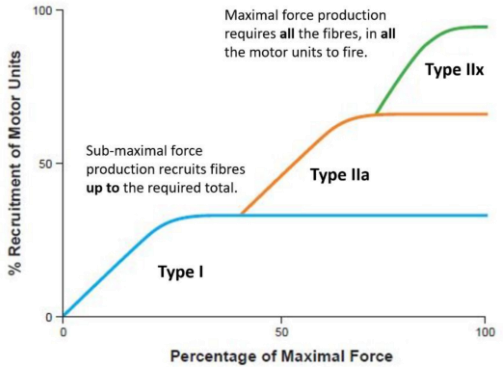
- Fast twitch fibres
- Fast contraction and powerful force
- Resistant to fatigue
- Need less oxygen
- Suited to speed, power and strength activities

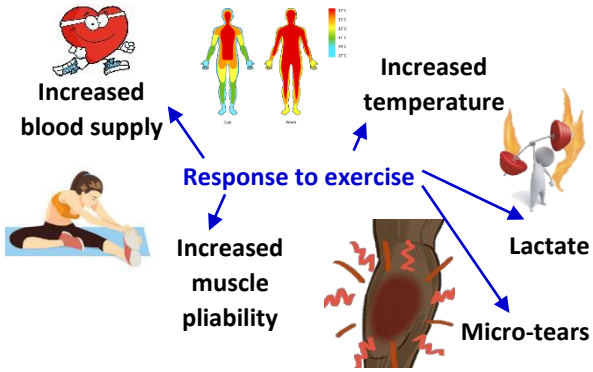
- Fast twitch fibres
- Rapid contraction
- Large force produced
- Fatigue so better suited to anaerobic short events
- Stop- start- sports

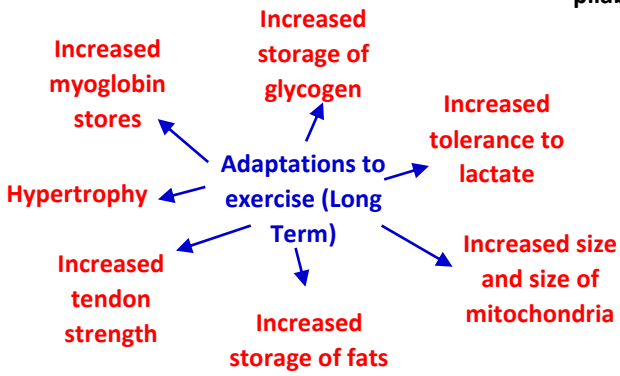
All or nothing Law

- Nerve stimulation is needed for contraction
- Motor units used which contain motor neurons.
- When a motor unit is stimulated all the muscles attached will contract









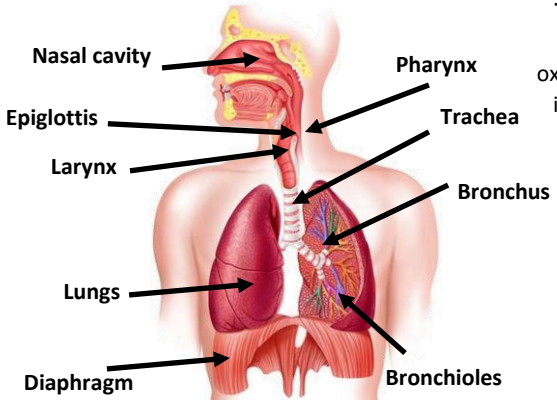
Additional Factors

Age: Muscle atrophy

Cramp: involuntary contraction

The Respiratory System

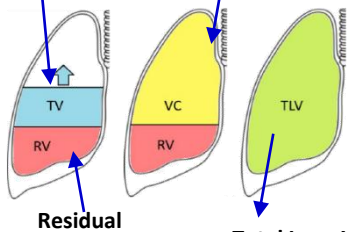
Structure of the Respiratory System



Lung Volumes

Tidal volume (amount of oxygen breathed in normal per breath

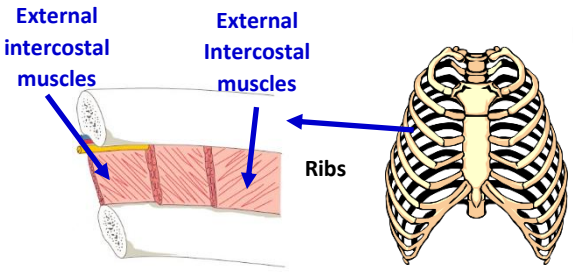
Vital capacity (maximal amount of air breathed out after maximum inhalation

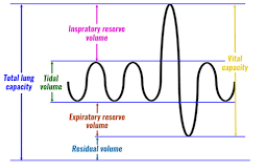


Pulmonary ventilation (Total amount of air inhaled per minute)

Residual Volume (volume of air left in the lungs

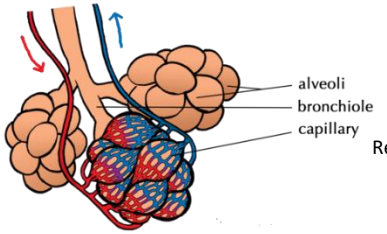
Total Lung Volume (maximal amount of air breathed out after maximum inhalation

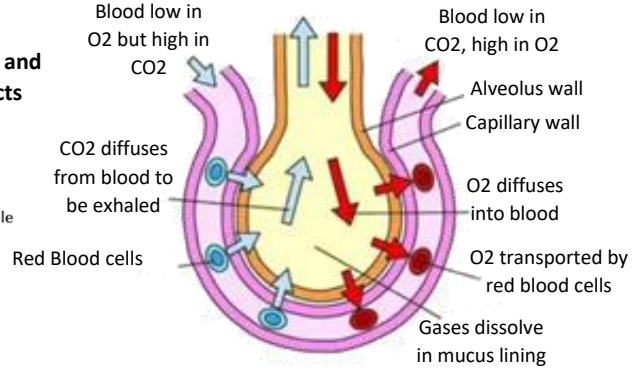


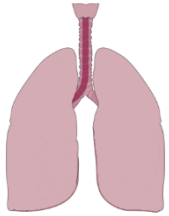


Gaseous Exchange

Process of exchanging oxygen and nutrients with waste products





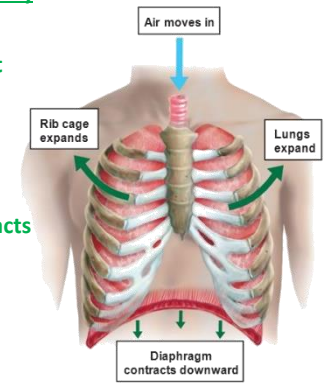


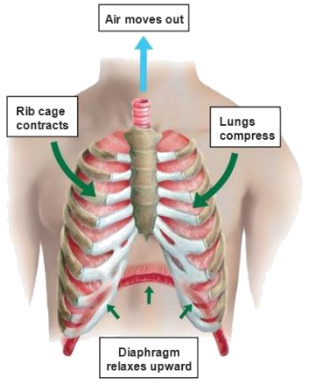
O2 enters the alveoli → O2 diffuses across alveoli membrane → Each alveolus has a network of capillaries → O2 diffuses across into the blood stream → O2 attaches to red blood cells → CO2 created through respiration → CO2 diffuses into the blood stream → Carried to the lungs → Diffuses across the alveoli membrane → Exhaled from the lungs with water vapour

Mechanics of breathing

Inspiration (air in)

Intercostal muscles contract → Ribs lifted → Diaphragm contracts and flattens → Thoracic cavity pressure drops → Air drawn in





Expiration (air out)

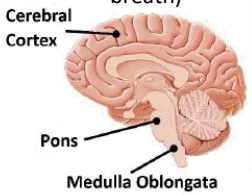
Intercostal muscles relax → Ribs lower → Diaphragm relaxes → Thoracic cavity increased → Air drawn out

Control of ventilation

Neural Control of Ventilation

Voluntary ventilation

Breathing can be controlled voluntarily by the cerebral cortex (e.g. holding your breath)



Voluntary ventilation

Breathing is controlled by the respiratory control centre (Medulla Oblongata)

Chemical Control of Ventilation

Chemoreceptors

Located in the aorta and medulla oblongata

Detect changes in blood acidity (pH)
-Exercise will increase lactate production
-Breathing increases
- Latic acid is broken down faster

Detect changes in blood CO2 concentration
-Exercise will increase
-CO2 removed more rapidly
-Breathing rate increases (dependent on exercise intensity)

Response to Exercise (short term)

Increased breathing rate

Increased tidal volume

Response to Training (Long term)

Increased vital capacity

Increased strength of respiratory muscles

Increased diffusion rates (O2/CO2)

Additional Factors

Asthma

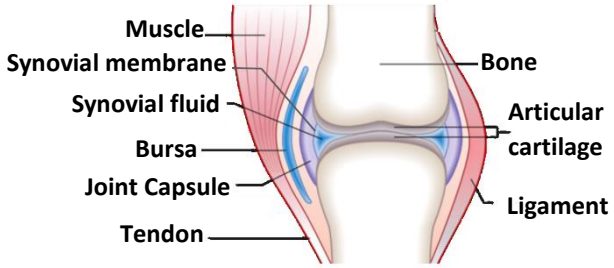
Effects of altitude/ partial pressure

Skeletal System

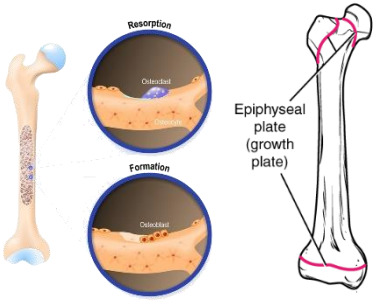
Functions

1) Supporting framework
2) Protection
3) Attachment for muscles
4) Blood cell production
5) Storage of minerals
6) Leverage
7) Weight bearing
8) Reducing friction at joints

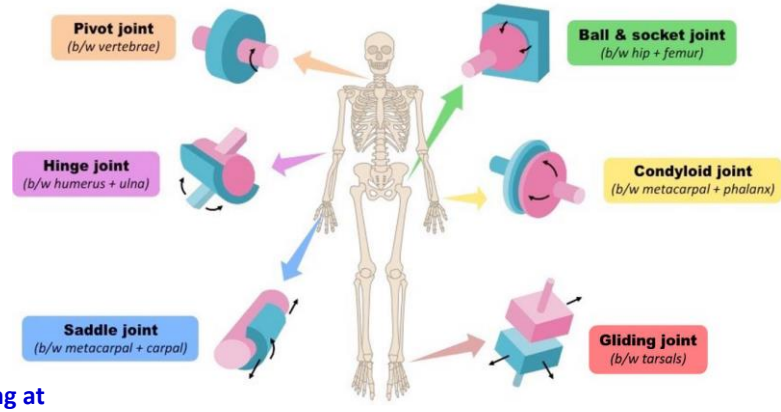
Structure of a joint



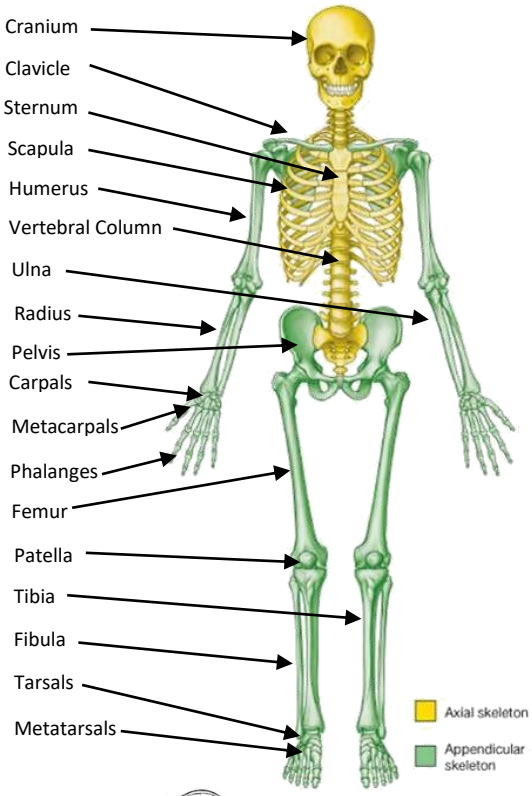
Bone Growth



6 Types of synovial joint



Bones



Types of Bone

	Long Bones	Leverage and red blood cell	Femur, Humerus
	Short Bones	Weight bearing	Tarsals, Carpals
	Flat Bones	Protection	Cranium, sternum
	Irregular Bone	Individualised function	Pelvis
	Sesamoid Bones	Reducing friction across a joint, embedded in a tendon	Patella

Bones forming at specific joints

Shoulder
Scapula, Clavicle, Humerus **Joint Type:** Ball & Socket
Elbow
Humerus, Radius, Ulna **Joint Type:** Hinge
Wrist
Carpals, Radius, Ulna **Joint Type:** Hinge
Hip
Illium, Pubis, Ischium, Femur **Joint Type:** Ball & Socket
Knee
Femur, Tibia, Fibula **Joint Type:** Hinge
Ankle
Tibia, Fibula, Talus **Joint Type:** Hinge

Short Term Effects of exercise

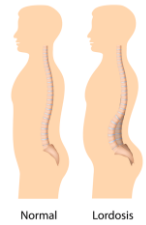
Increases of mineral uptake in bones due to weight bearing exercises.

Long Term Effects of exercise

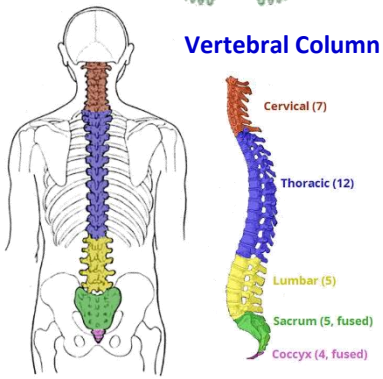
1) Increased bone strength
2) Increased ligament strength

Kyphosis

Lordosis



Vertebral Column



Ranges of movement at synovial joints