Why do people take part in physical activity?

People take part in physical activity to:

Get fit Improve skills Enjoyment learn Social Money

Relax Health Stress Improve appearance Aesthetic

Task 2: one example to illustrate the point from 1-4.

1. To improve body shape
   You can improve your body shape by weight training, 3 times a week in a 20 minute session.

2. To look and feel better
   Circuit training, 3 times a week in a 20 minute session, with a controlled diet.

3. For good health
   For good health you could go cross country running 2 times a week and have a controlled diet.

4. For enjoyment
   For enjoyment you could do your favourite sport as many times a week as you like.

Task 3: activities in your local sports centre.

Trampolining
Swimming
Indoor football
Basketball
Aerobics
Health and fitness
Gym

Task 4: write down 1-10 and explain what forfills that choice

1. To improve body shape - weight training.
2. To look and feel better - circuit training.
3. For good health - running (long distance).
4. For enjoyment – golf.
5. To relieve stress and tension – swimming.
6. For a physical challenge – cross country running.

7/8. For co-operation and competition – football.

9. For the aesthetic qualities – trampolining
10. To mix socially – gym/fitness.

Task 1:

Physical	Psychological	Social
To improve body shape	To look and feel better	For enjoyment
To look and feel better	For enjoyment	For co-operation and competition
For good health	To relieve stress and health	
For a physical challenge		
For the aesthetic qualities	For the aesthetic qualities	To mix socially

1. Psychological factors
   Personality – suitable sport?
   Motivation – if your keen.
   Arousal – laid back or to nervous, get right psyched up.
   Stress – stressed prom work etc.

2. Sociological factors
   Friends – like the sport as well.
   Parents – money to support you.

3. Luck
   Right place at the right time – just by chance.
   Family links you didn't know about – family support.

4. Motor skills

Brain – how quick signals travel from brain to foot.
Relation – if you can single out a motor skill you have a big boost in that sport.
Power – good for running.
Technique – brings motor skills to maximum.

5. Health and fitness

Body composition – fat: muscle ratio.
Body build – big muscles is good for weight training.

This is Iwan Thomas he is a 400m runner for Britain, he has been in the Olympics, Commonwealth Games and done very well. His personal best at 400m is 45.2.

This is Jamie Baulch he is also a 400m runner for Britain, he has been in the Olympics and has came 2nd with a personal best of 44.69.

Task 2: write down the five categories on page 35 and write down factors affecting performance.

Psychological Factors	Sociological factors	Luck	Motor skills	Health and fitness
Determination	Access to good facilities	Right place at the right time	Power	Muscular endurance
Ambition	A good coach	A born winner	Balance	Cardiovascular fitness
Attitude	Good friends		Agility	Muscular strength
Will to win	The school you go to		Reaction time	Body composition
Determination	Parents		Co-ordination	Speed
Motivation	Inspiration		Flexibility	Strength
Single minded	Experience		Skill	
Knowledge	Commitment		Technique	
Aggression	Charisma		Ability	
Passion	Team player		Precision	

Agility | Ability | Speed | Luck | Team player | Strong | Motivation

Control | Commitment | Body composition | Determination | Aggression

Personality | Balance | Respect for the sport | Stamina | Skill | Alert

Technique | Effort | Heart

Good charisma | Attitude

Factors that go to make a sporting champion

High performance | Deception

Single minded | Knowledge | Age | Speed | Intelligent | Enjoys the life style

Powerful | Experience | Born winner | Deals with pressure well | Commitment

Fitness | Right for the sport | Reactions | Attributes | Precision | Inspiriting

Definitions

- **Body composition** – is the percentage of body weight which is fat, muscle and bone.
- **Cardiovascular fitness** – is concerned with the healthy working of the heart, blood and blood vessels.
- **Exercise** – a form of physical activity done primarily to improve one's health and physical fitness.
- **Flexibility** – this area of Health Related Exercise enables us to have a good range of movement in our joints.
- **Fitness** – the ability to meet the demands of the environment.
- **Health** – a state of complete mental, physical and social well being.
- **Health related exercise (HRE)** – is thought to improve mental health and relieve stress. In itself, HRE does not guarantee good health as "a state of complete mental, physical and social well being". It includes cardiovascular fitness, muscular strength, muscular endurance, flexibility and body composition
- **Infectious** – diseases (those which are passed on from one person to another) have declined dramatically.
- **Muscular endurance** – is concerned with lifting light weights repeatedly without getting unduly tiered.
- **Muscular strength** – enables us to lift heavy weights.
- **Performance** – how well a task is completed.
- **Physical activity** – is exercise that improves health and physical fitness.

Diet

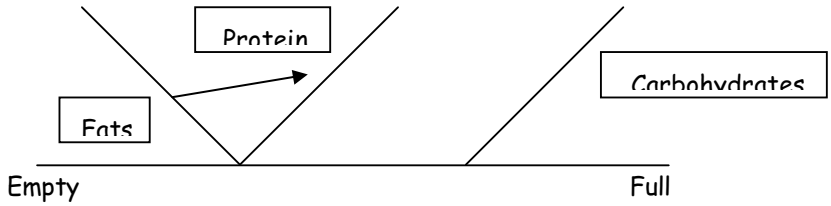
	Nutrients	Food	What are they used for
1.	Carbohydrates	Potatoes, bread, sweets and cereals	Energy
2.	Protein	Meat, fish, eggs and beans	Growth+repair
3.	Fats	Milk, butter, cheese and meat	Stored energy
4.	Vitamins	Fresh veg, citrus fruits and unprocessed foods	Cell chemistry
5.	Minerals	Iron from liver and calcium from milk+cheese	Iron- healthy blood. Calcium- bones and teeth
6.	Fibre	Vegetables, fruit and bread	Prevents constipation and bowel cancer
7.	Water	All kinds of drinks and nearly all kinds of food	To replace water which is lost

Joules and calories

Energy can be measured using joules or calories, but these are defined differently.

- A joule is defined as the energy needed when 1 kilogram (kg) is moved 1 metre by a force of 1 newton (N).
- A calorie (cal) is defined as the energy needed to raise the temperature of 1 gram of water by 1 degree (from 14.5 to 15.5 C).

When large units are involved, such as they are in diets, the terms kilojoule (KJ) (which equals 1000 joules) or megajoule (MJ) (1 million joules) are used. When, as an alternative, the term calorie is used, the kilocalorie (kcal) (which equals 1000 calories) is generally used.



We burn carbohydrates and then eat etc 4x a day, that fat line then moves towards the full. It is then harder to burn protein, fat.

Overweight- having weight in excess of normal. Not harmful unless it is accompanied by overfatness.

Overfat- having too much body composition as fat; men, having more than 19% of total body composition as fat; for women 26%.

Obese- extreme overweight, often considered as 20% to 35% above "normal"; probably best described as an extreme overfat condition.

The effects of under/overeating on body weight and performance

Optimum- 'most favourable' or 'best compromise'.

Factors affecting optimum body weight

These include:

- Height
- Sex
- Bone structure
- Muscle girth

For women and men who are the same height, the man would be expected to have a higher optimum weight.

On many age tables and height-to-weight tables Linford Christie would admit to being 'overweight' for his height and age. But no one would accuse him of being fat!

Bone structure and muscle girth play an important part in optimum weight. A person can be 'heavily built' without being overweight.

Obesity- obesity can be caused by some medical conditions, such as a defective thyroid gland, but also by overeating.

Eating disorders

In an effort not to become overweight or obese, some people, often teenage girls, suffer from a condition known as **anorexia nervosa**. This is described as a 'chronic illness. It can be very dangerous.

Bulimia nervosa is a condition in which the person is obsessed with the fear of becoming fat. Bulimics eat vast amounts of food, often in a short space of time, then vomit or use laxatives or other pills to control their weight. Bulimics often feel very guilty after 'bingeing'. Such habits can severely affect their health.

People can also be underweight without suffering either of these conditions.

Weight in sport

Being underweight can affect performance in most sports. Flat race jockeys are often deliberately underweight for their size in order to be able to ride at a prescribed weight for the horse.

In some sports there are weight categories or weight limits within which the participants must fit. Boxing is one which has been fraught with the problems of participants losing weight to come within a certain weight boundary, and this has sometimes been blamed for the boxers putting in a poor performance- being literally badly beaten or worse!

Often the manner in which the weight is lost is also important. In the case of boxers, for example, the weight may not be lost gradually by dieting over a period of time. Instead , if it has to be done quickly, it may be by exercising and perhaps wearing sweat suits and/or taking steam baths to lose fluid by sweating, which is not replenished. It may also be lost by taking certain drugs called diuretics.

The result of losing weight quickly in these ways is that the sportsperson can become **dehydrated** and may perform at a lower level than usual.

The seven factors of a balanced diet

Why Carbohydrates? - They are important because they maintain our body's energy stores. There are two types of carbohydrate:

- Sugars
- Starch

Carbohydrates are stored in the muscle and the liver as **glycogen**. This can be quickly converted into **glucose** and used as energy in the muscle, the brain and other organs.

Starch from complex carbohydrates provides the energy we need when taking part in sport and during our training sessions, so it is important for us to stock up again after our exertions.

Bread, pasta, potatoes and rice are some of the main sources of starches, which should form about 47 per cent of our daily energy.

Why protein? – When proteins have been digested, they go via the bloodstream as amino acids into the liver where they are processed for various purposes. The essential use of protein is as a body builder in respect of muscle, and as a repairer of damaged tissue. Protein is important for growth, training and repair when recovering from injury. It can also provide energy, but this is of less importance than that provided by carbohydrates and fat. It would only be considered an important source in the case of poor nutrition.

Why fats? – Fat is important because it provides energy and helps to make other things work, such as fat-soluble vitamins. The three types of fat are:

1. Saturated fats – normally found in animal fats and are liquid at room temperature; usually called oils.
2. Polyunsaturated fats.
3. Monounsaturated fats.

These figures are percentages of dietary energy. As alcohol also provides energy, the figures in brackets refer to those people who have no energy intake as alcohol. The overall recommendation for those who take alcohol is no more than 5 percent in the diet.

- Saturated fatty acids 10% (11%)
- Polyunsaturated fatty acids 6% (6.5%)
- Monounsaturated fatty acids 12% (13%)

Why vitamins? – We only require vitamins in small quantities and these should be supplied in a normal balanced diet. They are needed for a wide variety of reasons including:

- Good vision
- Good skin
- Red blood cell formation
- Healing
- Healthy bones and teeth
- Blood clotting

Vitamins come in two groups, those that can be dissolved in water and those that can be dissolved in fat – one reason for having adequate supply of fat in our diet.

As vitamins were discovered they were given a letter by which they are known. For example, thiamine became vitamin B1.

- Vitamin A is found in, among other things, milk, cheese, egg yolk, liver and carrots.
- Vitamin B1 is needed to release carbohydrates, and is found in whole grains, nuts and meat.
- Vitamin C is found in fruit and is helpful in healing and fighting infection.
- Vitamin E is found in vegetable oil.

Why minerals? – They are inorganic substances that our bodies need for a variety of functions.

Calcium is vital to health, especially during growth in childhood and adolescence. It is concerned with the formation and maintenance of bones and teeth, and helps to make the bones strong. Adults reach their peak bone mass around 30-35 years of age and after this there is a gradual decrease. It is important to maintain calcium intake as people get older. Milk, cheese and cereals from a major source of calcium in our diet

Iron is an essential mineral which is very important for the blood because of its link with **haemoglobin** and its effect on the oxygen-carrying capacity of the blood and formation of red blood cells. A lack of iron can lead to **anaemia** which makes people very tired, irritable and can also affect concentration. Iron is contained in many foods but the iron in meat is absorbed more easily.

Other minerals include **sodium**, which is needed for regulating body water content and is also involved with nerve functioning, while **potassium** and **magnesium** are also needed in large amounts. Other minerals are needed in smaller amounts, e.g. **zinc** and **selenium**. They are known as trace minerals.

Why fibre? -

- It adds bulk to food.
- It is important in the functioning of the digestive system.

Fibre is in the leaves, stems, roots, tuber, seeds and the fruit of plants. Processing and peeling can result in losing the actual fibre from the food itself.

There are two types of fibre:

- Soluble
- Insoluble

It is important to eat a variety of food to provide the diet with both types. Wholegrain cereals and wholegrain bread are sources of insoluble fibre, which is required as a bulking agent and to prevent constipation. Oats, fruit and vegetables are sources of soluble fibre needed to reduce blood cholesterol levels.

Why water? – Water is a means of transport for:

- Nutrients
- Waste
- Hormones

Water holds oxygen and is the main component of many cells. It also controls the distribution of electrolytes.

Body Composition

Body composition – is the percentage of body weight which is fat, muscle and bone.

Body fat – or percentage body fat, which weighing ourselves on scales tells us nothing about.

Body shape – one reason for taking part in sport is that it improves are body shape.

Define, describe and explain – define be exact with the answer, describe rough/brief description of subject and explain how something works in the body etc.

Health-related exercise – comes in five areas: Cardiovascular fitness
Muscular strength
Muscular endurance
Flexibility
Body composition

Lean body mass – 'the mass of bones, muscles, connective tissue and organs'.

Somatotypes

An often important factor in performance is body build or physique. This can be measured and the result is known as your **somatotype.**
There are three somatotypes:

- Endomorph
- Mesomorph
- Ectomorph

and each one of us is likely to be predominant in one of these.

Measurements needed

Various body measurements are needed in order to work out your somatotype and, together with your age and gender, these scores are read from a chart or worked out using a computer programme or CD-ROM.

The measurements taken are for:

- Height
- Weight
- Bone size
- Muscle girth
- Fat.

A score out of seven will then be given in the following categories:

- Fatness – endomorphy
- Muscularity – mesomorphy
- Linearity (thinness) – ectmorphy.

This table shows the builds of each somatotype.

Endomorph	Mesomorph	Ectomorph
		
tocky, large round body, short ıick neck, short arms and legs, ınsiderable body fat	Strongly built, broad muscular chest and shoulders, very muscular arms and legs, little body fat	Tall and thin, narrow body, spindly arms and legs, very little muscle and body fat

Key terms

Antagonistic muscles – two muscles that work together to move a limb.

Extension – the action of a muscle causing a limb to straighten.

Flexion – the action of a muscle causing a limb to bend.

Skinfolds – are taken by raising the skinfold with the thumb and forefinger of the left hand.

Ectomorphy – a somatotype characterized by linearity (thinness).

Endomorphy – a somatotype characterized by fatness.

Femur – is known as the thigh-bone and it is the largest bone in the body.

Fibula – slender bone on the outside of the tibia.

Gastrocnemius – is a muscle that forms most of the muscle commonly called the calf muscle. It starts at the back of the femur.

Humerus – is the bone at the top of the arm.

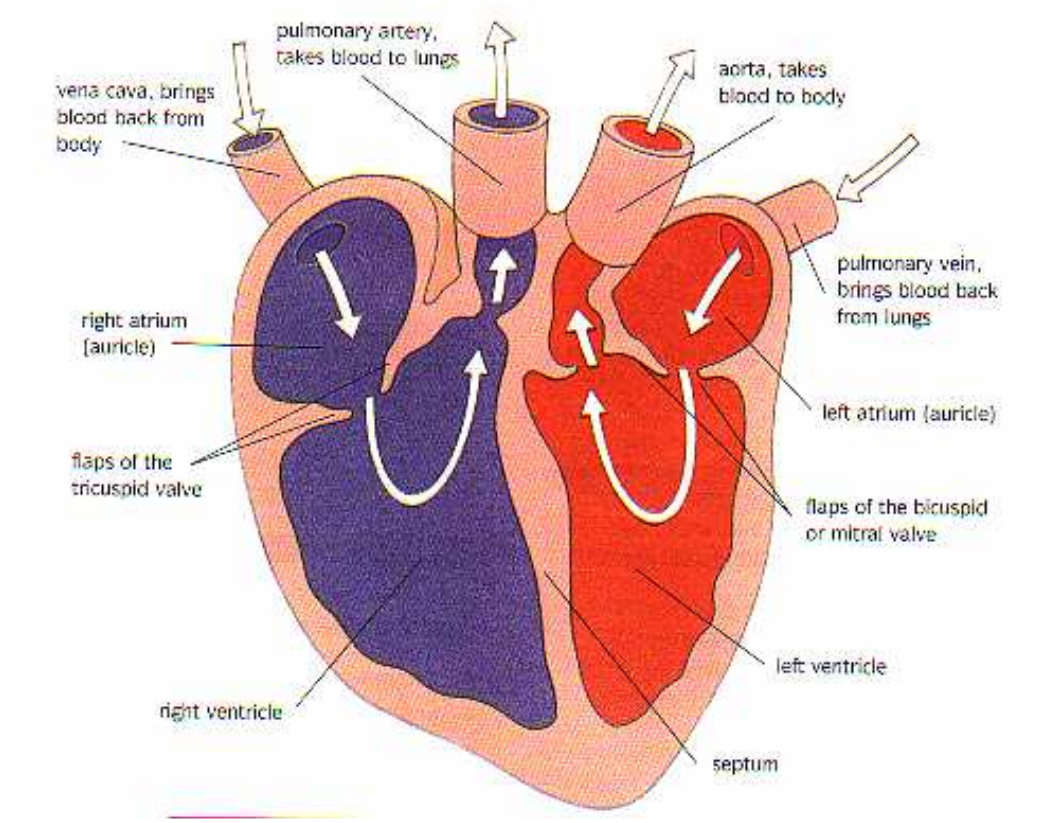
Mesomorphy – a somatotype characterized by muscularity.

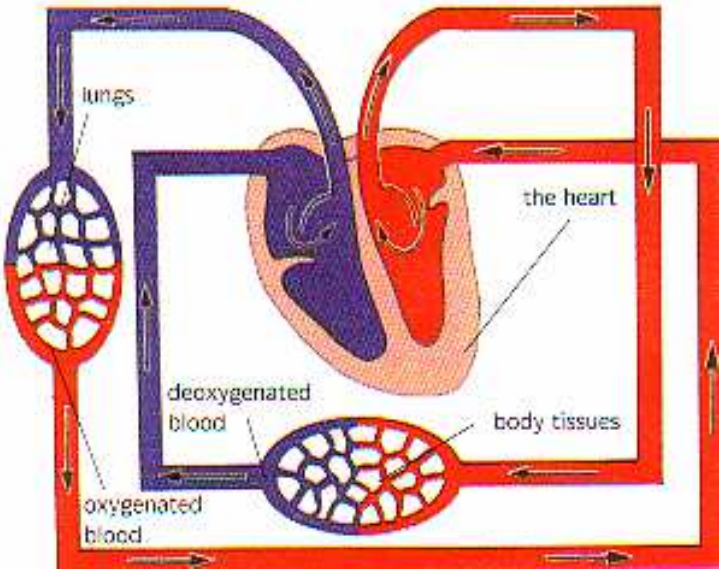
Radius – is one of the two bones that is in the lower arm.

Ulna – this is the other bone that is called the ulna, it is underneath.

Functions of the heart

The heart is a muscular pump. It is divided into halves by a central partition called the septum. Each half is then also divided by valves into an atrium above and a ventricle below. We therefore have a right and left atrium and a right and left ventricle.





Double circulatory pump system – pulmonary circulation carries blood from the heart to the lungs and back again; systemic circulation carries blood from the heart to all parts of the body except the lungs, and back again. The valves prevent the blood flowing backwards.

Key terms

Altitude – the height of something, especially above sea level.

Anaemia – a deficiency of red blood cells causing breathlessness and a lack of energy.

Aorta – takes blood to the body.

Arterial blood – oxygenated blood.

Arteries – thick walls, more elastic than veins, pulsate, have no valves, and carry blood away from the heart.

Arterioles – smaller parts of the artery.

Atrium – either of the two upper chambers of the heart into which blood passes from the veins.

Bicuspid or mitral valve – flaps on the left hand side of the heart.

Blood plasma – protein-containing fluid portion of the blood in which the blood cells and platelets are normally suspended.

Capillaries – the smallest of the blood vessels, very thin walls.

Cardiac cycle – the whole action of the heart and circulatory system.

Cardiovascular – relating to the heart and blood vessels.

Cardiovascular fitness – the fitness of the heart, blood and blood vessels and ability to exercise the entire body for long periods of time.

Haemoglobin – the red, oxygen-carrying pigment in red blood cells.

Heart rate – number of times the heart beats each minute.

Pulmonary artery – takes blood to the lungs.

Pulmonary vein – brings blood back from the lungs.

Red blood cells – carry supplies around the body.

Semi-lunar valves – venous blood is pushed through the semi-lunar valves.

Tricuspid valve – flaps on the right hand side of the heart.

Veins – blood vessels that carries blood towards the heart.

Vena cava – brings blood back from the body.

Venous blood – deoxygenated blood.

Ventricle – either of the two lower chambers of the heart that contract to force blood around the circulatory system.

Skill related fitness

Component	Definition	Example	How performance is improved
Agility	The ability to change the position of the body quickly and to control the movement of the whole body.	Goalkeeper	By stretching and keeping muscles supple.
Balance	The ability to retain the centre of mass (gravity) of the body above the base of support with reference to static (stationary) or dynamic (changing) conditions of movement, shape and orientation.	Gymnast	Develop general fitness level and breathing control.
Co-ordination	The ability to use two or more body parts together.	Golfer	Hand, eye and foot work to ensure correct striking of ball.
Power	The ability to do strength and performances quickly (power = strength x speed).	Long jumper	By building muscle bulk leading to greater strength in legs.
Reaction-time	The time between the presentation of a stimulus and the onset of movement.	Boxer	Using skipping rope and punch bag to improve reactions.
Speed	The rate at which an individual is able to perform a movement or cover a distance.	Sprinter	Resistance work and isometric exercises to increase explosive power, also ensure efficient breathing.

Above all the will to win is needed, without which no amount of training will produce success. Indeed this can often overcome superior fitness if the will to succeed is stronger in the individual or team.

Drugs in sport

A drug is a substance that can be taken in a variety of ways to produce expected and welcome physical and/or psychological effects on the person taking it. It may also cause some effects that are both unpleasant and unwanted. These are known as side effects.

There are three groups of drugs: -

Socially acceptable drugs: the doctor may prescribe these and we get them from the pharmacist and call them medicines – paracetamol and aspirin are among the most common. These drugs could be described as socially acceptable, because as long as you are of a certain age, they are not illegal.

Socially unacceptable drugs: this group includes heroin, cocaine, LSD, amphetamines, barbiturates, cannabis and ecstasy. These are illegal drugs.

Performance-enhancing drugs: this group includes some of the socially acceptable drugs and many of the illegal drugs.

The drugs that are mainly used in sport are the performance-enhancing group, this is because they make you perform better but they are dangerous. Performance-enhancing drugs fall into two categories: -

- Prohibited classes of substances
- Prohibited methods.

Prohibited classes of substances

In this category there are five groups of drugs that are used to produce different effects:

- Stimulants
- Narcotics/Analgesics
- Anabolic agents
- Diuretics
- Peptide, chemical and physical manipulation.

Stimulants: drugs that act on the central nervous system to make a person more alert. They include nicotine, caffeine, amphetamines and cocaine.

Narcotics/Analgesics: drugs that act by depressing the central nervous system. These give relief from painful injuries, but by allowing the injured player to take part the risk of severe or long lasting injury is increased. These drugs include such things as heroin, methadone, pethidine, powerful painkiller and morphine.

Anabolic steroids: drugs, banned in sport, that mimic the male sex hormone testosterone and promote bone and muscle growth.

Diuretics: used to increase the amount of urine produced and to increase kidney function, thereby speeding up the elimination of fluid from the body. Side effects of diuretics are dehydration, which can result in dizziness, muscle cramps, headaches and nausea.

Peptide, chemical and physical manipulation: these types of drug are often used to produce the same effects as anabolic steroids, namely, to increase muscle growth, to assist in recovery from injury and heavy training sessions and to increase the number of red blood cells to carry extra oxygen.

Prohibited methods: blood doping is a banned process, not a banned drug. It has been known for many years that if an athlete trains at high altitude the oxygen-carrying capacity of their blood increases. Because of this fact, athletes born at highaltitude have had a distinct advantage in the endurance events.
Therefore it has become a recognized practice for athletes to train at high altitude for a period of time and then to have as much as two pints of blood taken from their body and the red blood cells frozen. The body's system quickly recovers and the normal eight pints of blood is restored. Near a competition day, the red blood cells are put back into the athlete's blood stream and this process is thought to increase their performance by as much as 20%. Only in certain circumstances can this process be detected.

Beta blockers: beta-adrenoreceptor blocking drugs, more commonly called beta-blockers, work on the heart and circulatory system, reducing blood pressure and having other beneficial effects on the heart and circulation. Atenolol (Tenormin) and propranolol (Inderal) are common examples.

Beta blockers work by blocking the action of noradrenaline at special sites (receptors) in arteries and the heart muscle. Noradrenaline is a chemical that transmits messages between nerves and muscles, or between one set of nerves and another. By blocking its action, beta-blockers can cause arteries to widen and can slow the action of the heart and decrease its force of contraction. This results in a fall in blood pressure and reduced work by the heart.

Beta-blockers are used to lower high blood pressure, relieve angina (chest pain), correct arrhythmias (irregular heartbeats), reduce the risk of dying after a heart attack and treat heart failure.

The most common Side effects with beta-blockers are cold hands and feet, tiredness and sleep disturbance (nightmares). Less common side effects include, impotence, dizziness, wheezing, digestive tract problems, skin rashes and dry eyes.

The principles of training

Principle	Sporting examples	Definition
Systematic	If a person likes swimming and they are set a jogging programme which they dislike, the chances of them successfully getting fit and staying fit are minimal. In other words, do not use someone else's programme.	To fit individual needs, to get fit, make it suit your needs.
Specificity	If a sport for which you are training for is squash, your training would be quite different from someone who is training for the London Marathon.	You must do specific kinds of activity or exercise to build or improve specific body parts or skills.
Progression	Long jump, set yourself a distance and try and beat it in a specific amount of time. Swimming lots of lengths and improving the quality in a short period of time.	Starting slowly and gradually increasing the amount of exercise you do.
Over – load	Lifting 5kg on week one, week two go to ten. That's progressive overload. Running for 15 minutes, in the second week you run for 20 minutes, third week you do it 4 x a week instead of 3.	The principle of training with enough intensity to improve your performance.
Reversibility	In weight training if you lift lower weights, your muscles get smaller (atrophy). In running if you decrease in training then fitness is lost, relates to long distance running.	Any changes that take place as a consequence of training will be reversed when you stop training.
Regularity		Most benefit is gained from training on a regular basis.
Moderately		Getting the balance right between not training enough and training too much or over training.

FITT principle

Frequency (how long) – to improve fitness levels individuals must train 3 x per week.

Intensity (how hard) – in order to become fitter, body systems must work hard enough to make them adapt. Heart rate needs to be raised to 60% - 80% of the maximum heart rate. 220 – your age = mhr.

Time (how long) – length of session should be consistent and increase gradually.

Type (kind of activity) – activity will reflect the specific demands of the individuals concern.

Methods of training

Interval training – training using periods of work followed by rest intervals.

Continuous training – aerobic training, using exercise sessions with no rest intervals.

Fartlek running – literally 'speedplay', training using jogging, sprints and rest intervals.

Circuit training – a number of exercises set out so that you avoid exercising the same muscle group consecutively.

Weight training – using progressive resistance, either in weight lifted or number of times a weight is lifted.

Bones