Adrenaline
Natural hormone released to speed heart rate up.
Aerobic
With oxygen. When exercise is not too fast and is steady, the heart can supply all the oxygen that the working muscles need.
Summarised as: glucose + oxygen → energy + carbon dioxide + water.
Aerobic training zone
The aerobic training zone allows the aerobic system to be trained. To define aerobic training zone:
1. Calculate maximum heart rate (220 bpm) minus age: 220-age

2. Work at 60-80% of maximum heart rate
Agonist (prime mover)
Muscle or group responsible for the movement.

Agility
The ability to move and change directly quickly (at speed) whilst maintaining control.
Altitude
A geographical area (of land) which is over 2,000 m above sea level.
Altitude training (traditional)
Training at altitude where there is less oxygen. The body adapts by making more red blood cells to carry oxygen. The additional oxygen carrying red blood cells is an advantage for endurance athletes returning to sea level to compete.
Altitude sickness
Nausea caused by training at altitude.
Alveoli
Air sacs in the lungs.
Anaerobic
Without oxygen. When exercise duration is short and at high intensity, the heart and lungs cannot supply blood and oxygen to muscles as fast as the respiring cells need them.
Summarised as: glucose → energy + lactic acid.
Antagonist
Acts to produce the opposite action to the agonist. They work in antagonistic pairs.
Articulating bones
Where two or more bones meet to allow movement at a joint.
Axis
Imaginary line through the body around which it rotates. Types of axis:
- longitudinal (or vertical) – head to toe
- transverse – through the hips
- sagittal – through the belly button.

Backflow
The flowing backwards of blood. Valves in the veins prevent this from happening.
Balance

The maintenance of the centre of mass over the base of support. Reference can be made to whilst static (still) or dynamic (whilst moving).

Blood pressure

The pressure that blood is under. Types of pressure:

- systolic - when the heart is contracting
- diastolic - when the heart is relaxed.

Body composition

The percentage of body weight which is fat and non-fat (muscle and bone).

Cardiac cycle

The process of the heart going through the stages of systole and diastole (see Blood pressure) in the atria and ventricles (see Heart chambers).

Cardiac output

The amount of blood ejected from the heart in one minute
or
stroke volume x heart rate.

Cardio-vascular endurance (aerobic power)

The ability of the heart and lungs to supply oxygen to the working muscles.

Circuit training

A series of exercise stations whereby periods of work are interspersed with periods of rest.

Closed season

Post (transition). It is defined as:

- period of rest to recuperate
- players doing gentle aerobic exercise to maintain general fitness
- fully rested and ready for pre-season training.

Coordination

The ability to use different (two or more) parts of the body together, smoothly and efficiently.

Competition season (peak)

It is defined as:

- playing season
- taking part in matches every week
- maintenance of fitness related to the activity but not too much training as it may cause fatigue, which would decrease performance
- concentration on skills/set plays to improve team performance.

Continuous training

Involves working for a sustained period of time without rest. It improves cardio-vascular fitness. Sometimes referred to as a steady state training.

Delayed onset of muscle soreness (DOMS)

The pain felt in the muscles the day after exercise.

Excess post-exercise oxygen consumption (EPOC)

Sometimes referred to as oxygen debt (now an outdated term), EPOC refers to the amount of oxygen needed to recover after exercise. EPOC enables lactic acid to be converted to glucose, carbon dioxide and water (using oxygen). It explains why we continue to breathe deeply and quickly after exercise.

Expire
Breathe out.
Fartlek training
Swedish for ‘speed play’. Periods of fast work with intermittent periods of slower work. Often used in running, ie sprint, jog, walk, jog, sprint, etc.
Fatigue
Either physical or mental, fatigue is a feeling of extreme or severe tiredness due to a build-up of lactic acid or working for long periods of time.
Fine movement (skill classification)
Small and precise movement, showing high levels of accuracy and coordination. It involves the use of a small group of muscles.
Fitness
The ability to meet/cope with the demands of the environment.
FITT
FITT is used to increase the amount of work the body does, in order to achieve overload (see SPORT). FITT stands for:
- frequency – how often you train
- intensity – how hard you train
- time – the length of the training session
- type – the specific method, eg continuous training.

Flexibility
The range of movements possible at a joint.
Gross movement (skill classification)
Using large muscle groups to perform big, strong, powerful movements.
Haemoglobin
The substance in the red blood cells which transports oxygen (as oxyhaemoglobin) and carbon dioxide.
Health
A state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity (as per the World Health Organisation- WHO). Ill health refers to being in a state of poor physical, mental and/or social well-being.
Heart attack
It occurs when the flow of oxygen-rich blood to a section of heart muscle suddenly becomes blocked.
Heart chambers
They include the right and left atria and ventricles.
Heart rate
The number of times the heart beats (usually measured per minute).
High intensity interval training (HITT)
It’s an exercise strategy alternating periods of short intense anaerobic exercise with less intense recovery periods (see Interval training).
Hypertension
High blood pressure in the arteries.
Hypertrophy
The enlargement of an organ or tissue from the increase in the size of its cells.

Inspire
Breathe in.
Interval training
Periods of training/work that are followed by periods of rest, eg work, rest, work, rest (see High intensity interval training).
Isometric contraction
Muscle contraction where the length of the muscle does not alter. The contraction is constant, ie pushing against a load.
Isotonic contraction
Muscle contraction that results in limb movement:
- concentric contraction - shortening of the muscle
- eccentric contraction - lengthening of the muscle.

Lever
A rigid bar (bone) that turns about an axis to create movement. The force to move the lever comes from the muscle(s). Each lever contains:
- a fulcrum - fixed point, effort (from the muscle(s) to move it)
- load/resistance (from gravity).

Maximal heart rate
Calculated by: 220-age
Mechanical advantage
The efficiency of a working lever, calculated by: effort ÷ weight (resistance) arm
Minerals
Inorganic substances which assist the body with many of its functions, eg bone formation (Calcium).
Movement at a joint
Classified into:
- flexion – decrease in the angle of the bones at a joint
- extension – increasing the angle of bones at a joint
- abduction – movement away from the midline of the body
- adduction – movement towards the midline of the body
- rotation – movement around an axis
- plantar flexion – pointing the toes at the ankle/increasing the ankle angle
- dorsi flexion – toes up at the ankle/decreasing the ankle angle.

Muscular endurance (similar to dynamic strength)
Ability of a muscle or muscle group to undergo repeated contractions, avoiding fatigue.
One rep max
The maximal amount that can be lifted in one repetition by a muscle/group of muscles (with the correct technique).
Plane
Imaginary lines depicting the direction of movement. Types of planes:
- sagittal - forwards and backwards
- frontal - left or right
- transverse - rotation around the longitudinal axis.

Post season (transition)
Period of rest/active recovery/light aerobic work after the competition period (season).
Power/explosive strength (anaerobic power)
The product of strength and speed, ie strength x speed.
Pre-season (preparation)
It is defined as:
- period leading up to competition
- usually using continuous/fartlek/interval training sessions to increase aerobic fitness
- weight training to build up strength and muscular endurance
- developing techniques specific to the sport in order to be fully prepared for matches at start of season and therefore be more successful.

Principles of overload
Frequency, intensity, time and type (see FITT).
Principles of training
Specificity, progressive overload, reversibility and tedium (see SPORT).
Prime mover (agonist)
Muscle or muscle group responsible for the movement.
Pulse raiser
Any activity that raises heart rate. Usually as part of a warm up, eg light jog.
Qualitative
More of a subjective than an objective appraisal. Involving opinions relating to the quality of a performance rather than the quantity (eg score, placing, number).
Quantitative
A measurement which can be quantified as a number, eg time in seconds or goals scored. There is no opinion expressed (qualitative). It is a fact.
Reaction time
The time taken to initiate a response to a stimulus, ie the time from the initiation of the stimulus (eg starting gun in 100 m) to starting to initiate a response (eg starting to move out of the blocks in 100 m).
Recovery
Time required to repair the damage to the body caused by training or competition.
Repetitions
The number of times an individual action is performed. A set is a group of repetitions.
Residual volume
Volume of air left in the lungs after maximal expiration.
Season
A period of time during which competition takes place or training seasons, dividing the year up into sectional parts for pre-determined benefits. Training seasons include:
- pre-season (preparation)
- competition season (peak)
- post-season (transition).

Skeletal system
Skeletal system provides a framework of bones for movement, in conjunction with the muscular system.

Speed
The maximum rate at which an individual is able to perform a movement or cover a distance in a period of time, putting the body parts into action as quickly as possible.
Calculated by: distance ÷ time

Spirometer trace
A measure of lung volumes, which includes:
 tidal volume – volume of air inspired or expired/exchanged per breath

 inspiratory reserve volume – the amount of air that could be breathed in after tidal volume

 expiratory reserve volume – the amount of air that could be breathed out after tidal volume

 residual volume – the amount of air left in the lungs after maximal expiration.

SPORT (the principles of training)

Specificity
Making training specific to the sport being played/movements used/muscles used/energy system(s) used.

Progressive overload
Gradual increase of the amount of overload so that fitness gains occur, but without potential for injury. Overload is the gradual increase of stress placed upon the body during exercise training (more than normal).

Reversibility
Losing fitness levels when you stop exercising.

Tedium
Boredom that can occur from training the same way every time. Variety is needed.

Static stretching
Holding a stretch still/held/isometric.

Strength
The ability to overcome a resistance. This can be explosive, static or dynamic:
 explosive – see Power

 static – static ability to hold a body part (limb) in a static position. Muscle length stays the same/maximum force that can be applied to an immoveable object

 dynamic – see Muscular endurance for similarity.

Stroke volume
The volume of blood pumped out of the heart by each ventricle during one contraction.

Sub-maximal
Working below maximal intensity level.

Suppleness
As with flexibility, the range of movement possible at a joint.

Synovial joint

An area of the body where two or more bones meet (articulate) to allow a range of movements. The ends of the bones are covered in articular cartilage and are enclosed in a capsule filled with fluid. For the purposes of this specification, the following structural features and roles should be known:

- synovial membrane – secretes synovial fluid
- synovial fluid – provides lubrication
- joint capsule – encloses/supports
- bursae (sacks of fluid) – reduce friction
- cartilage – prevents friction/bones rubbing together
- ligaments – attach bone to bone.

Target zone

The range within which athletes need to work for aerobic training to take place (60-80% of maximum heart rate).

Training

A well-planned programme which uses scientific principles to improve performance, skill, game ability, motor and physical fitness.

Training thresholds

The actual boundaries of the target zone.

Validity

The extent to which a test or method measures what it sets out to measure.

Viscosity

Thickening of the blood.

Weight training

The use of weights/resistance to cause adaptation of the muscles.