



Physical Education: Principles of training

Keywords

Word	Definition
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 improves, 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. Use it or lose
Tedium	Boredom that can occur from training the same way every time. Variety is needed.
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.
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.

The principles of training: **SPORT**

Specificity

Progressive Overload

Reversibility

Tedium.



AQA Sport studies GCSE ST. Augustine's CC

Key principles of overload.

FITT: used to increase the amount of work the body does, in order to achieve overload

Frequency: how often you train

Intensity: how hard you train

Time: length of the training session

Type: specific method, used
eg continuous training





Warm ups and cool downs

Warming up should include:

- gradual pulse raising activity
- stretching
- skill based practices/familiarisation
- mental preparation
- increase amount of oxygen to the working muscles.



Cooling down should include:

- maintain elevated breathing and heart rate, eg walk, jog
- gradual reduction in intensity
- stretching

The benefits of warming up:

- effect on body temperature
- range of movement increased
- gradual increase of effort to full pace
- psychological preparation
- practice of movement skills through the whole range of movement
- injury prevention.

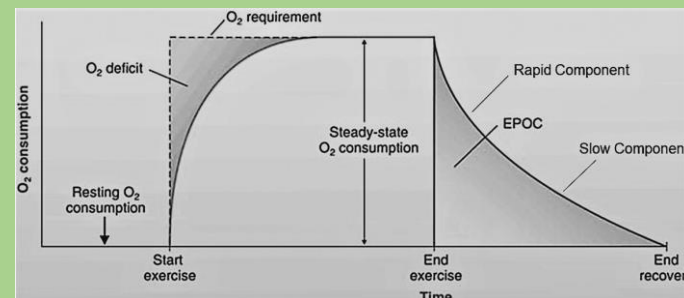


The benefits of cooling down:

- allowing the body to recover
- the removal of lactic acid/CO₂/waste products
- prevent delayed onset of muscle soreness (DOMS) - the pain felt in the muscles the day after exercise.

EPOC

Excess post-exercise oxygen consumption:



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.

Box 6: Pathway

Previous knowledge: from teaching sequence

Future links: from teaching sequence

Careers: from curriculum narratives

Box 7: Cross curricular links



Circuit training

A series of exercise stations whereby periods of work are interspersed with periods of rest. The content/demand of the circuit can be altered in order to improve different components of fitness.



Static stretching

A method used to increase flexibility; held (isometric) for up to 30 seconds, using correct technique. It should be pain free and it is advisable to avoid overstretching.



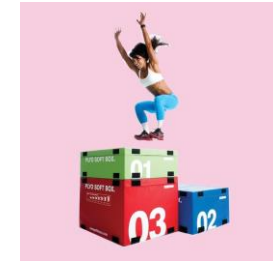
Continuous training

Sustained exercise at a constant rate (steady state) without rests, involving aerobic demand for a minimum of 20 minutes, e.g. running, swimming, rowing, cycling. It improves cardio-vascular fitness. Sometimes referred to as a steady state training. Appropriate to marathon runners.



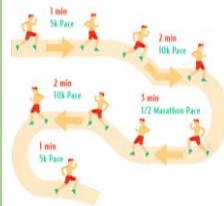
Plyometric training

Use of plyometric exercises e.g. bounding, depth jumping used to increase power. It includes an eccentric contraction (lengthening of the muscle) followed by rapid concentric contraction (shortening of the muscle).



Fartlek training

Swedish for 'speed play'. Periods of fast work with intermittent periods of slower work. Varying speed, terrain and work: rest ratios. Often used in running; sprint, jog, walk, jog, sprint, etc.



Weight training

The use of weights/resistance to cause adaptation of the muscles. Choose appropriate weight/exercise depending on fitness aim, e.g. strength/power training or muscular endurance

One rep max:

The maximal amount that can be lifted in one repetition by a muscle/group of muscles (with the correct technique).

Repetitions:

The number of times an individual action is performed. A **set** is a group of repetitions.



Interval training

Periods of training/work that are followed by periods of rest or low intensity exercise.

High intensity interval training (HITT)

Alternating periods of short intense anaerobic exercise with less intense recovery periods





Seasonal aspects of training

Three training seasons:

- Pre-season/preparation
- Competition/peak/playing season
- Post-season/transition.

Season: period of time during which competition takes place or training seasons, dividing the year up into sectional parts for pre-determined benefits.

Pre-season (preparation): Period leading up to competition. Includes...

- Continuous / fartlek / interval training sessions to increase aerobic fitness.
- Weight training to build up strength and muscular endurance
- Sport specific techniques in order to be fully prepared for matches at start of season and therefore be more successful

Competition season (peak): playing season; taking part every week. Includes...

- Maintenance of fitness related to the activity being careful not to cause fatigue, which would decrease performance
- Concentration on skills/set plays to improve team performance.

Post-season (transition): Period of rest/active recovery/light aerobic work after the competition season to recuperate but maintain general level of fitness. Fully rested and ready for pre-season training.

Altitude

A geographical area (of land) which is over 2,000m above sea level.

Altitude training (traditional)

A form of aerobic training.

- Training at high altitude where there is less oxygen in the air and oxygen carrying capacity is reduced.
- The body adapts by making more red blood cells to carry oxygen.
- The additional oxygen carrying red blood cells are an advantage for endurance athletes returning to sea level to competition for a limited period.

Can result in altitude sickness: Nausea caused by training at altitude

Training zones:

The **aerobic** training zone allows the aerobic system to be trained. To define aerobic training zone:

1. Calculate maximum heart rate (220 bpm) - age.
2. Work at 60-80% of maximum heart rate.

The **Anaerobic** training zone allows the aerobic system to be trained. To define Anaerobic training zone:

1. Calculate maximum heart rate (220 bpm) - age.
2. Work at 80-90% of maximum heart rate.

Training thresholds

The actual boundaries of the target zone.



Box 6: Pathway

Previous knowledge: from teaching sequence

Future links: from teaching sequence

Careers: from curriculum narratives

Box 7: Cross curricular links