

Principles and Methods of Training Revision Guide

St Mary's Catholic Academy

GCSE Physical Education



Principles of Training

The principles of training are the 'golden rules' of designing a fitness training program for an individual sports man/woman. The principles of training help to guarantee success and will aid performers to reach their training and performance goals. All training is aimed at creating long-term physical changes in the body system, these are referred to adaptations.

The acronym SPORT can be used to remember the main principles:

Specificity

Progressive

Overload

Reversibility

Tedium

Specificity

Training must be relevant to the individual and their sport. This can be achieved by tailoring training specifically for the sport or even the position that the individual plays, the muscle groups that they use the most or the dominant energy system of the athlete. aerobically.



CASE STUDY

Usain Bolt is a 100 m sprinter and is likely to train very differently to Mo Farah who is a 10 km racer despite them both being track athletes. Usain Bolt will focus on speed and power while the Mo Farah will train for cardiovascular fitness and the ability to work at high intensity



Progressive and Overload

Training **frequency, intensity, time or type (FITT)** must be increased over the training period to ensure that the body is pushed beyond its normal rhythm. Increases must be gradual so that the athlete avoids a plateau in performance or, worse, injury.

CASE STUDY

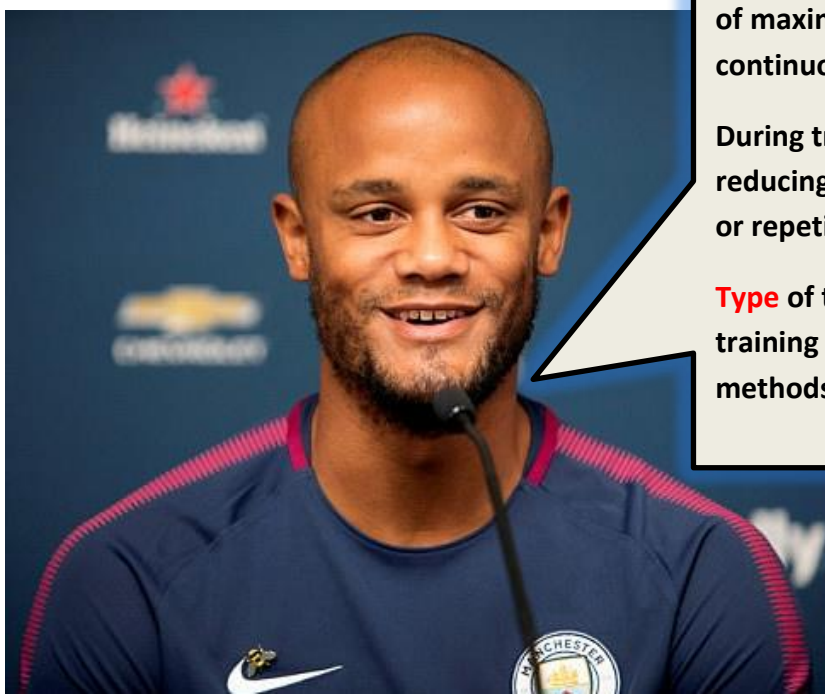
Vincent Kompany is a professional football player for Manchester City. Vincent Kompany ensures his training program is increased over time to develop his football ability and physical performances.

My training **frequency** is increased by Pep as we are training a greater number of times each week.

My training **intensity** is increased by lifting a greater resistance, such as with weight training, or by training at a higher percentage of maximum heart rate (maxHR). We do this either through continuous or interval training.

During training session **time** is manipulated by training for longer, reducing recovery times or by completing a greater number of sets or repetitions.

Type of training is manipulated by Pep as he offers a variety of training types and experiences to the team by combining training methods.



Reversibility

Our body systems reverse or de-adapt if training stops or is significantly reduced or injury prevents training from taking place. It is essential to avoid breaks in training and to maintain the motivation of the athlete.

Case Study

When Ronaldo finished his football career, his regular training routine stopped too. This meant his body systems reversed and his body shape and fitness levels represented the lack of training. This therefore affected his ability to play within legend/ charity matches. If Ronaldo had continued his training during his retirement then the reversibility of his fitness would never have occurred.



Tedium

Athletes need variety in their training to prevent boredom which can lead to reversibility. The principle of tedium is applied when a trainer or coach builds variety into the training by changing the training methods.



Case Study

While Hope Powell was manager of the Female England football club, she regularly changed and adapted the training sessions to ensure the players didn't become bored. The training sessions involved cardio vascular work, muscular strength work, skill development and games. This kept the players interested and engaged in the training sessions ensuring they could perform at their maximum ability.

Training Thresholds

Training is effective when it specifically targets the individual athlete. One way of achieving this is by targeting the most relevant training threshold. For many athletes this involves calculating a specific working heart rate.

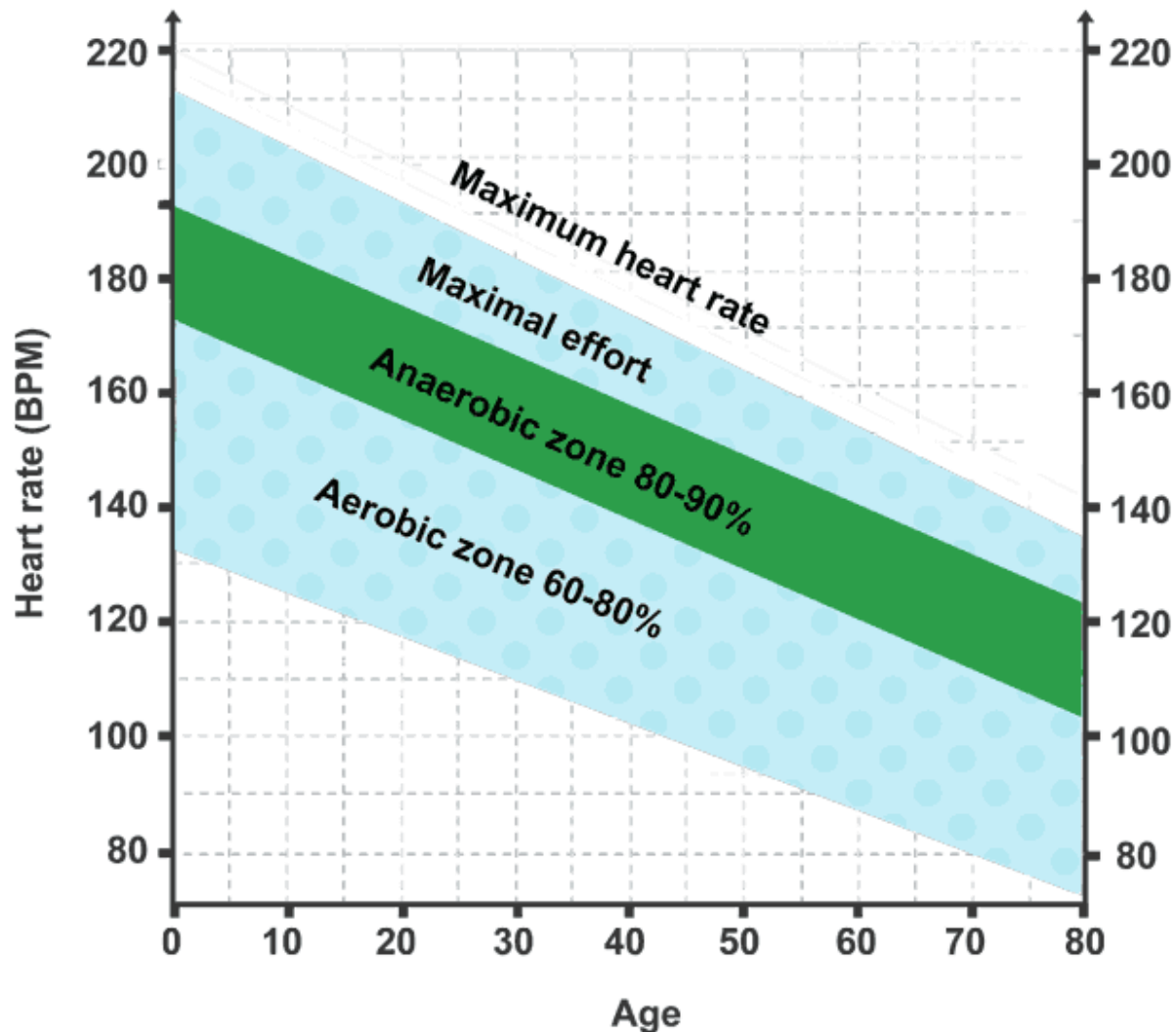
$$\text{Maximum heart rate} = 220 - \text{age}$$

A 20-year-old athlete might want to calculate their maximum heart rate in order to accurately calculate their training threshold:

$$\text{Maximum heart rate} = 220 - 20$$

$$\text{Maximum heart rate} = 200 \text{ beats per minute (BPM)}$$

Once you have calculated the maximum heart rate, you can calculate the training thresholds.



Training Thresholds Examples

A 20-year-old distance runner wants to calculate working intensity within the aerobic zone:

20-year-old woman doing long-distance running on the beach at sunset

Maximum heart rate = 200

Lower training threshold of the aerobic zone = 60% of maxHR

Lower training threshold = 0.6×200

Lower training threshold = 120 BPM

Upper training threshold of the aerobic zone = 80% maxHR

Upper training threshold = 0.8×200

Upper training threshold = 160 BPM

Therefore the 20-year-old aerobic athlete needs to target their training between 120 - 160 BPM to make the training effective.

A 35-year-old basketball player wants to calculate working intensity within the anaerobic zone:

35-year-old basketballer in action

Maximum heart rate = 185

Lower training threshold of the anaerobic zone = 80% of maxHR

Lower training threshold = 0.8×185

Lower training threshold = 148 BPM

Upper training threshold of the anaerobic zone = 90% maxHR

Upper training threshold = 0.9×185

Upper training threshold = 167 BPM

Therefore the 35-year-old anaerobic athlete needs to target their training between 148 - 167 BPM to make the training effective.

Case Study



Name – James Anderson

Age – 35

**Profession – Professional Cricket
player**

Role in the squad – Bowler

**Current Club – Lancashire
Country Cricket Club**

James Andersons Training Thresholds –

Maximum Heart Rate - $220 - \text{age} =$ _____

Lower Training Threshold of the aerobic zone = 60% of max HR

$0.6 \times \text{MHR} =$ _____

Upper training threshold of the aerobic zone = 80% of max HR

$0.8 \times \text{MHR} =$ _____

Lower training of the anaerobic zone = 80% of max HR

$0.8 \times \text{MHR} =$ _____

Upper training threshold of the anaerobic zone = 90% of max HR

$0.9 \times \text{MHR} =$ _____

Case Study



"Hi Everyone, Jess here. I have recently been training for the Tokyo 2020 Olympics".

"I am hoping you can do me a favour please. My head training coach has asked for your help. We need you to write a paragraph explaining the principals of training".

“This will help us be able to plan my new training plan. You can also try writing me a new training program for me to follow if you feel you can help”.

THANK YOU

[illegible]

