

OCR Sports Science Knowledge Organiser

RO42 Applying the Principles of Training

Learning Outcome 1: Know the principles of training in a sporting context

Progressive overload by increasing frequency, intensity, time, type and adherence (FITTA)
e.g More repetitions from one session to another.

Specificity, i.e. practices a skill used in a sport, trains the muscle group(s) predominantly used in the sport (e.g passing the ball in rugby)

Moderation, i.e. taking into account age, gender, environment and experience (e.g. a session which will include young athletes and mature performers)

Reversibility/regression, i.e. 'use it or lose it' (e.g. where injury may affect performance)



Variance, i.e. avoiding boredom, gives the body a different challenge, mixture of fitness

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Learning Outcome 2: Know how training methods target different fitness components

Aerobic and anaerobic exercise

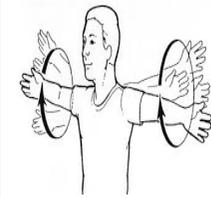
Difference between aerobic and anaerobic exercise, i.e.

- aerobic, i.e. utilising oxygen to fuel the body during exercise
- anaerobic, i.e. fuelling the body during exercise without using oxygen



Methods of training aerobically and anaerobically

- aerobic, i.e. steady and not too fast (e.g. walking, jogging, cycling)
- anaerobic, i.e. performed in short, fast bursts (e.g. weight lifting, interval training)



The components of fitness

Strength, i.e. the extent to which a muscle or muscle groups can contract against resistance (e.g. restraining an opponent in rugby)

Power, i.e. exerting muscular strength rapidly (e.g. sprint start)

Agility, i.e. move quickly and change direction under control (e.g. weaving between objects or opponents in a zig-zag motion).



Balance, i.e. the ability to maintain a position (e.g. handstand)

Flexibility, i.e. the ability to move joints through an ample range of motion (e.g. performing the splits in gymnastics)

Muscular endurance, i.e. the ability of a muscle to sustain repeated contractions (e.g. cycling)

Cardiovascular endurance, i.e. the heart and lungs getting blood and oxygen to muscles and them using it (e.g. long distance running)

Aerobic training methods

Continuous , Interval , fartlek

Anaerobic training methods

Resistance training , Interval (HIIT), power (plyometrics and sprints)

Specific training methods for each of the fitness components

cardiovascular training (e.g. steady state (continuous), Interval training)

Fartlek training)

Resistance training (e.g. resistance machines, free weights, circuits)

Power training (e.g. interval training, plyometrics, repetition and acceleration sprint training)

Flexibility training (e.g. static (passive and active), dynamic)

Agility training (e.g. agility ladder, agility hurdles)

Balance training (e.g. balance board, exercise ball) .

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Learning Outcome 3: Be able to conduct fitness tests

Tests which assess fitness, i.e.

According to protocols and guidelines set down by the fitness industry (e.g. Does the subject need to seek medical advice before performing tests? How does test procedure ensure accuracy?)

Tests for each component of fitness

- strength (e.g. burpee test, squat test)
- power (e.g. vertical jump test, standing long jump test)
- agility (e.g. shuttle run test, Illinois agility run test)
 - balance (e.g. standing stork test)
 - flexibility (e.g. sit and reach test, trunk flexion test)
- muscular endurance (e.g. number of sit-ups/press-ups in a defined time period)
- cardiovascular endurance (e.g. Cooper run, Harvard step test)

Maximal or sub-maximal.

- Maximal when performer works at maximum effort or tested to exhaustion (e.g. Cooper run test, bleep test)
- Sub-maximal when performer works below maximum effort (e.g. Harvard step test, tri-level aerobic test)

Test sequence

e.g. Always conduct the tests in the same order to aid validity of results, the order in which fitness tests are performed can affect the outcome of further tests.

How to interpret the results of fitness tests, i.e.

Against **normative data** (e.g. how do the outcomes compare to average results for the tests used?)

Validity (e.g. a speed test using shuttle runs may actually test a person's ability to turn, which is more about agility than speed)

reliability (e.g. the conditions of the test must always be identical so that it is most likely that the same results will be produced)



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Learning Outcome 4: Be able to develop fitness training programmes

Design a fitness training programme, i.e.

Gather details about the subject the programme is for (e.g. age, any recent or current injuries, health problems, access to facilities)

Clarify the aims of the training programme (e.g. which components of fitness need to be improved and by how much)

Set realistic goals which can be measured (e.g. reduce the time it takes to complete a 5k run by 2 minutes)

Duration of the training programme (e.g. suitable length to achieve goals)

Suitability of activities (e.g. activities meet the needs of the subject, activities target specific areas)
Organisation of activities (e.g. variety of training methods,



Adaptability (e.g. an activity can be performed inside or outside in case of bad weather)

Progression (e.g. applies the FITTA principle)

Evaluate the effectiveness of the training programme, i.e. measurement (e.g. repeat tests and compare results against original results)

Reflection on self / interview subject (e.g. Were the goals met? Did I include an appropriate range of training methods? Did the training methods used target my needs / the needs of the subject? Did I / you stick to the training programme?)

Improvement (e.g. need more results or more accuracy in results, adjust the duration of the training programme).

