Knowledge Organiser

Unit 1 BTEC Sport Level 2

Pearson BTEC

Fitness for Sport and Exercise

Introduction to fitness for Sport and exercise

All sports performers want to be the best they can be. To reach optimal levels requires years of dedication to training, including successfully overcoming any barriers (such as injury) which might prevent a performer from achieving their goals. Working closely with their coach, the performer will gain an appreciation and understanding of the different fitness components, training principles, training methods and fitness tests which can be incorporated into their training regime to further enhance and improve their sports performance. Physical and skill-related fitness components, including aerobic endurance, body composition and power, are related to positive health and wellbeing. Sports performers train regularly to improve and maintain their fitness levels and performance. Their training programmes are tailored to their specific training needs and their sport. A performer's training cycle can incorporate lots of different fitness training methods, such as circuits for muscular strength and endurance. Incorporating different fitness training methods keeps training interesting, which helps to keep motivation levels high.

Components of physical fitness

Speed: distance divided by time. Speed is measured in metres per second (m/s). The faster an athlete runs over a given distance, the greater their speed.
Muscular Strength: The maximum force (in kg or N) that can be generated by a muscle or muscle group.
Flexibility: having an adequate range of motion in all joints of the body; the ability to move a joint fluidly through its complete range of movement.
Body composition: The relative ratio of fat mass to fat-free mass (vital organs, muscle, bone) in the body.
Aerobic Endurance: The ability of the cardiorespiratory system to work efficiently, supplying nutrients and oxygen to working muscles during sustained physical activity.
Muscular Endurance: The ability of the muscular system to work efficiently, where a muscle can continue contracting over a period of time against fixed resistance.

Components of physical fitness

Reaction time: The time taken for a sports performer to respond to a stimulus and the initiation of their response.
Balance:-The ability to maintain centre of mass over a base of support there are two types of balance: static balance and dynamic balance.
Coordination: The smooth flow of movement needed to perform a motor task efficiently and accurately.
Agility:-The ability of a sports performer to quickly and precisely move or change direction without losing balance or time.
Power: The product of strength and speed expressed as the work done in a unit of time.

Types of stretching

Static
Dynamic
Active
Passive
PNF
(Proprioceptive Neuromuscular Facilitation)

Exercise intensity

- Intensity – Exercise intensity refers to how hard you are working. To measure this you need to know your heart rate (HR) and apply HR intensity to fitness training methods.
- Target zones and training thresholds should be used to calculate target training zones and apply HR max to training: HR max = 220 – age.
- 60–85% HR max is the recommended training zone for cardiovascular health and fitness. Cardiovascular fitness is the capacity of the cardiovascular system (heart, lungs and vessels) to efficiently supply oxygenated blood to working muscles. Cardiovascular fitness is how well and efficiently your blood circulates through your body.
- The Borg (1970) (6–20) Rating of Perceived Exertion (RPE) Scale is a simple method of rating perceived exertion and can be used by coaches to gauge an athlete's level of intensity in training and competition. Perceived exertion is an individual's rating of exercise intensity, formed by assessing their body's physical signs such as heart rate, breathing rate and perspiration/sweating. be used as a measure of exercise intensity
- FITT: Frequency, Intensity, Time and Type. It is important that this is applied to training to ensure progress is made.

THE VICTORY ACADEMY

1 - 10 Borg Rating of Perceived Exertion Scale	
0	Rest
1	Really Easy
2	Easy
3	Moderate
4	Sort of Hard
5	Hard
6	
7	Really Hard
8	
9	Really, Really, Hard
10	Maximal: Just like my hardest race

FITT

Principles of training

- Progressive Overload: In order to progress, training needs to be demanding enough to cause the body to adapt, improving performance.
- Specificity: Training should be specific to the individual's sport, activity or physical/skill-related fitness goals to be developed.
- Individual differences/needs: The programme should be designed to meet individual training goals and needs.
- Adaptation: How the body reacts to training loads by increasing its ability to cope with those loads. Adaptation occurs during the recovery period after the training session is completed.
- Reversibility: If training stops, or the intensity of training is not sufficient to cause adaptation, training effects are reversed.
- Variation: It is important to vary the training regime to avoid boredom and maintain enjoyment.
- Rest and recovery are required so that the body can recover from the training and to allow adaptation to occur.



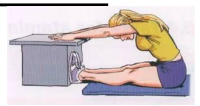

The importance of fitness testing

- Fitness testing is important as it allows participants to be given a baseline, this data can then be interpreted and used to create a training program.
- Fitness testing allows participants to compare themselves to normative and published data. This allows for participants to set goals.
- Monitoring data will allow participants to demonstrate physical improvement.
- Tables of results allow for comparison.
- Its important that tests are reliable, valid and relevant.
- Results can give a performer something to aim for/goal setting.

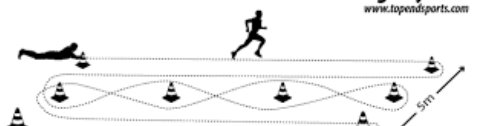
Fitness test methods for components of fitness:

- Flexibility: sit and reach test (usually measured in cm or inches)
- Strength: Grip Dynamometer (usually measured in KgW)
- Aerobic endurance:
  - Multi-stage fitness test, known as the bleep test (usually predicted in ml/kg/min)
  - Forestry step test (usually predicted in ml/kg/min) .Definition of VO2 max (ml/kg/min): the maximum amount of oxygen uptake, usually measured in ml of oxygen per kg of body mass per minute. It is a measure of cardiorespiratory endurance.
- Speed: 35m sprint (usually measured in s)
- Speed and agility: Illinois agility run test (usually measured in s)
- Anaerobic power: vertical jump test (usually measured in kgm/s)
- Muscular endurance: one-minute press-up, one-minute sit-up (usually measured in number of reps/minute)
- Body composition: Body Mass Index (BMI) (usually measured in kg/m²).Skinfold testing via the Jackson-Pollock nomogram method for prediction of percent body fat .

(sites for males: chest, abdominal and thigh; sites for females: triceps, suprailiac and thigh).


Sit and reach test

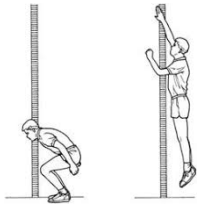
Grip Dynamometer



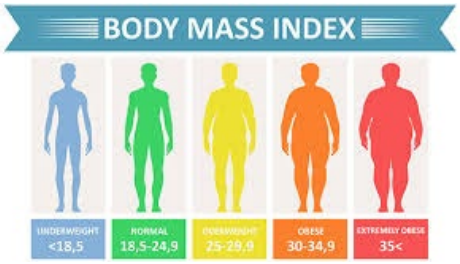
Illinois agility run test

35m sprint

Vertical jump test



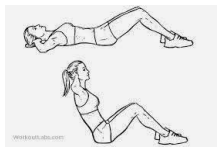
Forestry step test



Body Mass Index (BMI)


Skinfold testing


One-minute press-up


Sit up test