THE DUSTON SCHOOL
Knowledge itself is power
4-19

Year 10 BTEC Sport Knowledge Booklet

Unit 1

Name:

Class:

Unit 1 - Fitness for Sport and Exercise
Big Questions

1. Why fitness components are important for sporting success?

2. How do we determine exercise intensity?

3. How can we use principles of training to plan and undertake a training programme effectively?

4. What are the different methods of training which can improve the fitness of a performer?

5. How can we use fitness tests to determine fitness levels?

Examination

The examination is an IT based Onscreen test.

This unit is externally assessed using an onscreen test. The examination board sets and marks the test. The test lasts for 1 hour 15 minutes and has 60 marks.

The test has different types of questions including objective and short-answer questions. Where appropriate, questions contain graphics, photos, animations or videos.

An onscreen calculator is available for questions requiring calculations.

An onscreen notepad is available for making notes.

Grade Boundaries

Typical boundaries:

U grade - 0 - 15 Marks

L1 Pass - 16 - 24 Marks

L2 Pass - 25 - 33 Marks

L2 Merit - 34 - 43 marks

L2 Distinction- 44 - 60 Marks

Key Content

Topic A.1 Components of physical fitness

Topic A.2 Components of skill-related fitness

Topic A.3 Why fitness components are important for successful participation in given sports

Topic A.4 Exercise intensity

Topic A.5 The basic principles of training (FITT)

Topic A.6 Additional principles of training

Topic B.1 Requirements for fitness training methods

Topic B.2 Additional requirements for each of the fitness training methods

Topic B.3 Fitness training methods

Topic C.1 Fitness test methods for components of fitness

Topic C.2 Importance of fitness testing to sports performers and coaches

Topic C.3 Requirements for administration of each fitness test

Topic C.4 Interpretation of fitness test results

BTEC Sport Unit 1 – External Exam

Health Related Components of Fitness

Aerobic Endurance	It is the ability of the cardio-respiratory system to efficiently supply nutrients and oxygen to working muscles during sustained physical activity. It is used mainly for low intensity exercise that lasts for a long time.
Muscular Strength	The maximum force a muscle or muscle group can produce. (Measured in N or KG)
Muscular Endurance	It is the ability of a muscle or group of muscles to keep contracting over a period of time against light to moderate load. It is the ability of the muscles to keep repeating the same action and keep working efficiently.
Flexibility	Having an adequate range of motion in all joints of the body. It is the ability to move a joint through its complete range of movement.
Speed	The ability to perform a movement or cover a distance in a short period of time = distance/time taken. Measured in metres per second
Body Composition	This is the relative ratio of fat mass to fatfree mass (vital organs, muscle, bone) in the body.

Skill Related Components of Fitness

Balance	The ability to maintain your centre of mass over a base of support. Static balance means being balanced without movement. Dynamic balance means staying balanced while moving.
Agility	The ability of a sports performer to quickly and precisely move or change direction without losing their balance
Coordination	The smooth flow of movement needed to perform a task efficiently and accurately. It often involves being able to use 2 or more body parts together.
Reaction Time	The time taken for a sports performer to respond to a stimuli and the start their response.
Power	The work done in a unit of time. It is the ability to apply a combination of strength and speed. Power = Force(kg)xDistance (m)/time (min or s)

Exercise Intensity

Exercise intensity: how hard an individual is training.

Heart Rate
For exercise to be effective, you need to be training between the lower and upper thresholds of max heart rate.
Lower = 60% Upper = 85%
Maximum heart rate (HR max) = 220 – age (Years)

RPE (rating of perceived excursion)
This can be used to predict the exercise HR (heart rate) of an individual by calculating:

Principles of Training

Specificity – matching your training to the requirements of the sport.

Progressive Overload – Gradually increasing your training using FITT to ensure that your fitness improves without the risk of injury

Individual Needs – matching your training to your personal needs.

Rest and Recovery – Time in between training sessions to allow the body to make adaptations and to repair and renew

Reversibility – Any improvements in fitness will be lost when training stops.

Adaptation – this occurs during the recovery period after the training session is complete.

Variation – changing your sessions to maintain interest and motivation

FITT principle
Use these to increase your training for Progressive Overload

Frequency – the number of times you train per week

Intensity – how hard you train (measured in % or HR)

Time – how long your training session is

Type – how you train.

Fitness Testing

Aerobic Endurance	Multi-Stage Fitness test Forestry step test	Speed	35 meter sprint test
Muscular Strength	Hand Grip Dynamometer	Body composition	Skin Fold callipers BIA and BMI
Muscular Endurance	60 second sit up test 60 second press up test	Agility	Illinois Agility run
Flexibility	Sit and reach test	Power	Vertical jump test

Key Content

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Aerobic endurance training

Continuous training: this is training at a steady pace and moderate intensity for a minimum period of 30 minutes

Fartlek training: this is where the intensity of training is varied by running at different speeds or over different terrain. The training is continuous with no rest period.

Interval training: this is where the individual performs a work period followed by a rest or recovery period.

Circuit training: this is where different stations/exercises are used to develop aerobic endurance. The station order/order of exercises is important to ensure different muscle groups are used to avoid fatigue. The number of stations, time spent at each station, number of circuits, rest period between exercises and number of circuit sessions per week can be varied.

Muscular strength, muscular endurance and power training

Circuit training: this is where different stations/exercises are used to develop strength, muscular endurance and power. The stations/exercises use different muscle groups to avoid fatigue.

Free weights: = use of barbells or dumb-bells to perform different types of dynamic exercises Resistance machines - push and pull Use when training for strength (low reps and high loads), use when training for endurance (high reps and low loads) Training for strength endurance (50–60% 1RM and 20 reps – repetitive movements of a muscle or muscle group)Training for elastic strength (75% 1RM and 12 reps – for producing movements in very close succession, like in gymnastics) Training for maximum strength (90% 1RM and 6 reps – producing a single movement against a resistance/load), reps, sets, rest period.

Plyometrics: this type of training develops sport-specific explosive power and strength. It is used by sports performers such as sprinters, hurdlers, and netball, volleyball and basketball players. Plyometric exercises need maximal force as the muscle lengthens (eccentric action) before an immediate maximal force as the muscle shortens (concentric action). Types of exercises include lunging, bounding, incline press-ups, barrier hopping and jumping. This type of training needs to be performed carefully because it can cause muscle soreness.

Flexibility training

Static: there are two types of static flexibility training. Firstly active stretching, which is performed independently where the performer applies internal force to stretch and lengthen the muscle. The second is passive stretching, also known as assisted stretching, which requires the help of another person or an object such as a wall. The other person/object applies external force causing the muscle to stretch.

Ballistic: this is where the performer makes fast, jerky movements through the complete range of motion, usually in the form of bobbing or bouncing. Ballistic stretching is specific to the movement pattern of the sport/activity to be performed. It needs to be undertaken with care as the technique can cause muscle soreness and strains

Proprioceptive Neuromuscular Facilitation (PNF) technique: this is used to develop mobility, strength and flexibility. The technique may be performed with the help of a partner or alternatively by using an immovable object (as resistance to inhibit movement).

Fitness testing – considerations

Fitness tests are important because:

- Provide baseline data to compare against normative results and further test results.
- Provide a starting point for a training programmes
- Provides clear goals and aims for an athlete

Pre-test procedures:

- Gaining informed consent
- Calibration of equipment

Accurate measurement and recording of results:

- Allow sufficient time to practice before you do each test to check accuracy of data.
- Use appropriate data collection method for each test.
- Record each results as you go along so you don't forget it.
- All tests should be repeated.
- Use correct units of measurement.
- Compare against normative data to interpret results.

Reliability, validity and practicality of testing methods:

- Reliability – if you were to repeat the same test again in the same conditions and environment, would you get the same result?
- Validity – accuracy of results. Did the test measure what you needed it to measure?
- Practicality – resources, time and equipment available?

Speed training

Hollow sprints: a series of sprints separated by a 'hollow' period of jogging or walking.

Acceleration sprints. This is where the pace is gradually increased from a standing or rolling start to jogging, then to striding, and then to a maximum sprint. Different drills can be used, such as resistance drills and hill sprints. Rest intervals of jogging or walking are used in between each repetition.

Interval training: the individual performs a work period followed by a rest or recovery period. For speed training, the work intervals will be shorter and more intense – performed at a high intensity, close to maximum. Increase the number of rest periods and increase work intensity to develop speed

Wider Reading

Specification—https://qualifications.pearson.com/content/dam/pdf/BTEC-Firsts/Sport/2012/Specification-and-sample-assessments/9781446936368_BTECFIRST_AWD_SPORT_SPEC_ISS4.pdf

TheEverLearner—https://www.theeverlearner.com/

MrGillPE— http://www.mrgillpe.com/unit-1.html

MrBPE—https://www.youtube.com/channel/UC4aEFy_BrFnHC3S-x1Bsfqw

ThePETutor—https://www.youtube.com/watch?v=ahOGFYb35ZY&list=PLaXgo24frbVtlWzcRDMrra2Dol13UO1DU

BrianMac—https://www.brianmac.co.uk/

Typical Exam Questions

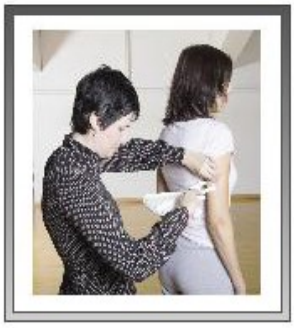
Each picture (**A** and **B**) shows fitness tests for different components of fitness.

Match the component of fitness to each fitness test. (2)

Click on each picture and then the correct component of fitness.

A

B



Component of fitness

- Flexibility
- Strength
- Muscular endurance
- Anaerobic power
- Body composition

Answers:

A - Flexibility

B - Body composition