THE DUSTON SCHOOL
Knowledge itself is power
4-19

Year 11 BTEC Sport Knowledge Booklet

Unit 3

Name:

Class:

BTEC Sport Unit 3
Big Questions

Learning Aim A

- What is the difference between a short, medium and long term goal?
- How do you set effective goals?
- How can you use personal information to help design a training programme?
- How can you use FITT to ensure a training programme is effective?

Learning Aim B

- What are the names and locations of the key bones and muscles in our body we need for movement?
- What are synovial joints, where are they located and what movement do they allow?
- Can you locate the key areas in the cardiovascular and respiratory systems?

Learning Aim C

- Can you complete an effective 6 week training plan?
- How do you measure success of each session you complete?

Learning Aim D

- How effective was the 6 week programme?
- How do you measure success of the programme?
- What individual need will you work on next?

Assignments

Learning aim A: Design a personal fitness training programme

Design a training programme based on personal information you have collected using one training method and the FITT principles for a sport you studied in Unit 2.

Learning aim B: Know about the musculoskeletal system and cardiorespiratory system and the effects on the body during fitness training

Design a Booklet/leaflets that identify the location/function of the structures in the musculoskeletal and cardiovascular system.

Learning aim C: Implement a self-designed personal fitness training

programme to achieve own goals and objectives

Complete your 6 week training programme and maintain an accurate training diary. Complete a summary at the end of each week explaining how you will develop your training for the forthcoming week.

Learning aim D: Review a personal fitness training programme

Conduct a review of your training programme. Fully explain the results, strengths and improvements for the training programme, justifying recommendations for future training and performance.

Key Content

Learning Aims:	Content Requirements:
Learning Aim A Be able to: Independently design a safe six-week personal fitness training programme to meet an activity/sport goal taking into consideration personal information Design a safe six-week personal fitness programme to meet an activity/sport goal which meets the needs of the individual, showing creativity in the design Justify the training programme design, explaining links to personal information	**Components of Fitness:** **Health Related**: Body Composition, Strength, Muscular Endurance, Flexibility & Cardiovascular Fitness **Skill Related:** Agility, Balance, Power, Speed, Coordination & Reaction Time
Learning Aim B Know about the musculoskeletal system and cardiorespiratory system and the effects on the body during fitness training	**Training Methods**: Continuous, Fartlek, Interval, Weight, Plyometric & Circuit
Learning Aim C Be able to Implement a self-designed personal fitness training programme to achieve own goals and objectives	**Personal Information:** • Attitudes, the mind and personal motivation for training **Goal Setting** • Short term, Medium term and Long term goals. **Smarter Targets** **S**pecific **M**easurable **A**chievable **R**ealistic **T**ime Related **E**valuated **R**ecognised/ Rewarded
Learning Aim D Be able to Review a personal fitness training programme	**Principles of Training** **F**requency **I**ntensity **T**ime **T**ype **R**eversibility **I**ndividual Needs **P**rogressive Overload **S**pecificity **A**daptation **R**est & Recovery **V**ariation

Safely follow your six-week fitness training programme

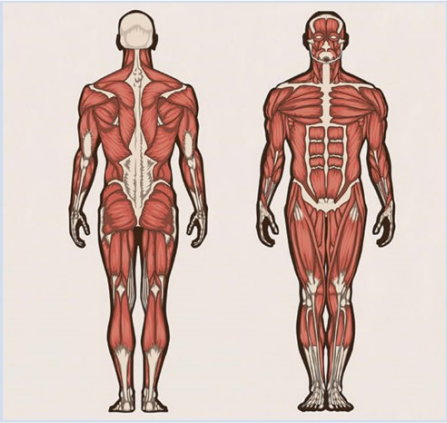
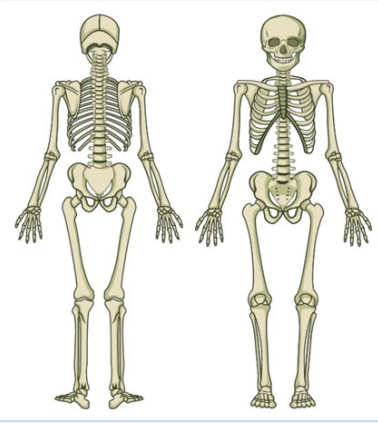
- Complete the full fitness training programme through participation in the selection of activities in a safe environment. Wear the correct kit and following all safety procedures. Collect pictures and videos of you participating.

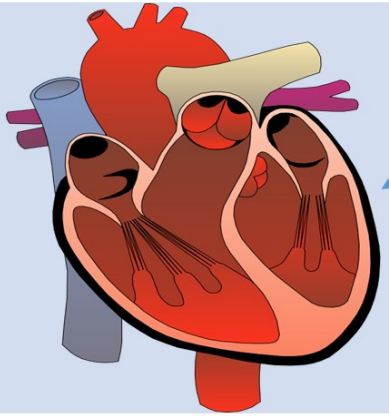
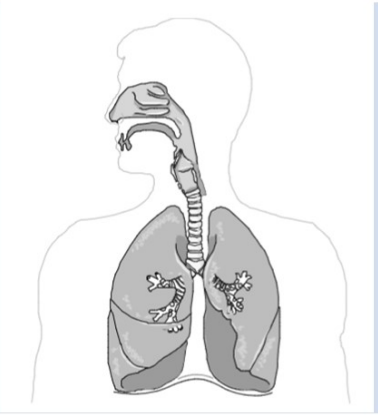
Component of Fitness	Fitness Test	Training Method
Strength	1RM	Weight/ Circuit
Muscular Endurance	1min Press up + Sit up	Weight/ Circuit
Flexability	Sit & Reach	PNF, Static, Ballistic
Cardiovascular Endurance	Multistage Fitness	Continuous/ Fartlek/ Circuit/ Interval
Agility	Illinois Agility Test	Circuit
Balance	N/A	Circuit
Power	Vertical Jump	Weight/ Circuit/Plyometrics
Speed	35m Sprint	Interval/ Hollow / Accelerative Sprint
Coordination	N/A	N/A
Reaction Time	N/A	N/A
BMI	BMI / Skin calliper / BIA	N/A

Record your progress in a training diary

- Date, time and location, aims and objectives, session duration, type(s) of training and what methods of training used and resources and intensity.
- Log of personal performance and achievements in each session. Details of how progressive overload was achieved over the course of the programme. A summary of the success of each session; what worked, what didn't work and what you did or will do to amend the session in future.
- Achievement of programme goals, aims and objectives, your enjoyment, dedication and commitment to training that week, motivation for training and changes you have made to your programme.

Key Content

Muscular System	Can you label the following?	Skeletal System
	cranium, clavicle, scapula, ribs, sternum, humerus, radius, ulna, pelvis, femur, patella, tibia, fibula deltoid, biceps, triceps, pectoralis major, latissimus dorsi, external obliques, gluteus maximus, quadriceps, hamstrings,	

Cardiovascular System	Can you label the following?	Skeletal System
	Left and right atria, left and right ventricles, aorta, vena cava, pulmonary artery, pulmonary vein the lungs, bronchi, bronchioles, alveoli and diaphragm.	

Assessment Criteria

Assessment criteria

Level 1	Level 2 Pass	Level 2 Merit	Level 2 Distinction
Learning aim A: Design a personal fitness training programme			
1A.1 Design a safe four-week personal fitness training programme to meet an activity/sport goal taking into consideration personal information, with guidance. #	2A.P1 Independently design a safe six-week personal fitness training programme to meet an activity/sport goal taking into consideration personal information. #	2A.M1 Design a safe six-week personal fitness training programme to meet an activity/sport goal which meets the needs of the individual, showing creativity in the design. #	2A.D1 Justify the training programme design, explaining links to personal information. ##
Learning aim B: Know about the musculoskeletal system and cardiorespiratory system and the effects on the body during fitness training			
1B.2 Outline the structure and function of the musculoskeletal and cardiorespiratory systems	2B.P2 Describe the structure and function of the musculoskeletal and cardiorespiratory systems	2B.M2 Explain the short-term effects on the musculoskeletal and cardiorespiratory systems during the fitness training programme	
1B.3 Outline some of the short-term effects on the musculoskeletal and cardiorespiratory systems during the fitness training programme	2B.P3 Summarise the short-term effects on the musculoskeletal and cardiorespiratory systems during the fitness training programme		

Homework

Homework will be set twice per week. Homework tasks will be dependent upon the stage reached within individual assignments.

Likely tasks will include:

- Researching for assignment content
- Production of assignment content / notes
- Extension work in order to attain higher grades

What needs to be learnt

Learning aim A: Design a personal fitness training programme

Topic A.1 Personal information to aid training programme design

- Personal goals: specific, measurable, achievable, realistic, time-related, exciting, recorded (SMARTER):
  - short-term goals (set over a short period of time, between one day and one month)
  - medium-term goals (should give progressive support towards achievement of long-term goals)
  - long-term goals (what they want to achieve in the long term, and the best way of doing this).
- Aims (details of what they would like to achieve for the selected activity/sport).
- Objectives (how they intend to meet their aims using an appropriate component of fitness and method of training).
- Lifestyle and physical activity history.
- § Medical history questionnaire.
- § Attitudes, the mind and personal motivation for training.

Topic A.2 Programme design

- Use personal information to aid training programme design.
- Selection of appropriate training method/activity for improving/maintaining the selected component of fitness, e.g. flexibility, strength, muscular endurance and power, aerobic endurance, speed.
- Safe design: appropriate method/selection of an appropriate combination of activities to meet personal training needs, goals, aims and objectives.
- § Application of the basic principles of training - Frequency, Intensity, Time and Type (FITT).
- § Application of the additional principles of training.
- Selection of appropriate activities for warm-up (light, continuous physical activity to prepare the body for exercise).
- Selection of appropriate activities for cool down (light, continuous physical activity to reduce heart rate, remove lactic acid and prevent blood pooling).
- § Creative design: consideration given to prevent/avoid barriers to training occurring, ensuring exercise adherence is maintained and the programme is enjoyable, for example including interesting, different exercise activities to maintain motivation and commitment, and to prevent boredom.
- § Intensity:
  - target zones and training thresholds (calculating and applying maximum heart rate (HR max) to training):
  - HR max = 220 – age (years)
  - 60–85% HR max is the recommended training zone for cardiovascular health and fitness
  - Borg Rating of Perceived Exertion (RPE) Scale (1970) (6–20) can be used as a measure of exercise intensity
  - the relationship between RPE and heart rate where RPE × 10 = HR (bpm).

What needs to be learnt

Learning aim B: Know about the musculoskeletal system and cardiorespiratory system and the effects on the body during fitness training

Learners should know features of the musculoskeletal system and cardiovascular system sufficient to understand the short term effects of exercise

Topic B.1 Musculoskeletal system

- Location of the major muscles: deltoid, biceps, triceps, pectoralis major, latissimus dorsi, external obliques, gluteus maximus, quadriceps, hamstrings, gastrocnemius and tibialis anterior.
- Location of the major bones: cranium, clavicle, scapula, ribs, sternum, humerus, radius, ulna, pelvis, femur, patella, tibia, fibula,
- Structure and function of the synovial joints at the hip, shoulder, knee, elbow.
- Short-term effects of fitness training on the musculoskeletal system:
  - the use of a warm-up and flexibility exercises to increase joint range of movement
  - § planning for progressive overload to encourage micro tears in muscle fibres

Topic B.2 Cardiorespiratory system

- Structures of the cardiovascular system: atria, ventricles, aorta, vena cava, pulmonary artery, pulmonary vein.
- Structures of the respiratory system: lungs, bronchi, bronchioles, alveoli, diaphragm.
- Short-term effects of fitness training on the cardiorespiratory system:
  - increased heart rate and breathing rate during fitness training activities to supply oxygen to working muscles
  - § increased build-up of lactic acid as a result of increased intensity in the main component.

Key Content: To be evidenced within this assignment

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What needs to be learnt

Topic A.4 Long-term adaptations of the cardiorespiratory system:

- decrease in resting heart rate: resting heart rate is able to slow down because the heart is trained to pump a larger quantity of blood with every beat
- increase in heart size and strength
- § increase in stroke volume
- § the heart can pump more blood per beat, so resting heart rate decreases (bradycardia); heart becomes more efficient and does not need to beat as quickly to supply the body with oxygenated blood
- § decreased risk of hypertension (high blood pressure)
- § increased Vital Capacity (VC) – due to improved lung function (Vital Capacity is the amount of air that can be forcibly expelled from the lungs after breathing in as deeply as possible)
- § increased efficiency to deliver oxygen and remove waste products
- § increased lung efficiency and gaseous exchange
- § increased maximum oxygen uptake (VO_2 max).

Learning aim B: Know about the different energy systems used during sports performance

Topic B.1 The anaerobic energy system – not using oxygen:

Sports that use this system to provide energy are very high intensity and explosive. That is, they use short bursts of exercise lasting a few seconds, for example, javelin throw, weightlifting, sprinting, high jump.

§ **Topic B.2 ATP-CP/alactic acid anaerobic system:**

- § reliance on stored adenosine triphosphate (ATP) (the molecule that produces the energy in all living things), energy supplied by ATP (up to four seconds)
- § another stored molecule, creatine phosphate (CP) helps restore ATP
- § CP is restored aerobically (with oxygen)
- § energy is supplied by ATP and CP (four to 20 seconds)
- § when this system runs out of ATP-PC stores, glycolysis takes place.

§ **Topic B.3 Glycolysis/lactic acid anaerobic system:**

- § ATP is made from glucose stored in the liver and muscles
- § energy is supplied by ATP, CP and muscle glycogen (20 to 45 seconds)
- § energy is supplied by muscle glycogen (45 to 240 seconds)
- § waste product is lactic acid
- § when this system is unable to maintain energy requirements, the aerobic system starts to produce energy
- § sports that use this system to provide energy are moderate to high intensity, i.e. short bursts of exercise lasting a few minutes, e.g. running 400 m, 800 m, and 1500 m distances.

continued

What needs to be learnt

Learning aim C: Implement a self-designed personal fitness training programme to achieve own goals and objectives

Topic C.1 Safely implement a personal fitness training programme

- Using an appropriate training method (e.g. taking part in planned sessions), performing to the best of your ability, gaining agreement from coach/trainer for any missed sessions, understanding the importance of commitment.
- Wearing correct training gear, safe and correct use of equipment, implementation of correct technique, awareness of wider safety issues, e.g. personal safety if training outdoors.
- § Taking full responsibility for completing and recording details for each training session.

Topic C.2 Training diary for each session recording

- Date, time and location for training undertaken.
- Aims and objectives for each session.
- Session duration.
- Type of training undertaken – selected method/activity.
- Programme details (FITT).
- Log of personal performance and achievements.
- Resources required, e.g. equipment.
- § The principles of progressive overload and details of how progressive overload has been achieved over the course of the programme.
- § Details of programme intensity using % HR max and RPE.

§ **Topic C.3 Measures for success**

- § Types of motivation (intrinsic and extrinsic).
- § Benefits of motivation and self-confidence to successfully complete a fitness training programme.
- § Motivation for training, including details in the diary of personal feelings before, during and after each training session.
- § Details of how the programme has been adapted to ensure continued commitment to training, for example using a variation of activities/training methods.
- § Achievement against personal aims, goals and objectives, for example how performance has been taken to a higher level.

continued

What needs to be learnt

Learning aim D: Review a personal fitness training programme

Topic D.1 Review programme

Review, including short term physiological effects, improvements as a result of the programme to meet the activity/sport goal.

- § After each training session.
- § Evidence of modifying the programme to achieve planned personal goals.
- Strengths: areas of the programme where and how personal aims and objectives have been achieved with reference to measures of success.
- Areas for improvement: where outcomes do not meet planned goals.
- § Recommendations for improving future training and performance, for example personal training needs, use of different training methods/activities or strategies, use of psychological training techniques to improve performance.

Wider Reading

You might choose to look at the following to give you a greater understand of the topics for this unit: -

Example PARQ—https://www.exerciseregister.org/media/images/REPs_Members_PAR_Questionnaire_Long_Verion.pdf

Example Medical history questionnaire—https://www.acefitness.org/ptresources/pdfs/AssessmentForms/6-SampleHealth-HistoryQuestionnaire.pdf

Unit 1 Recap (Training methods, zones and FITT)—https://www.varndean.co.uk/_site/data/files/documents/making%20the%20grade/Sport%20BTEC%20revision%20notes.pdf

Muscular System —https://www.bbc.co.uk/bitesize/guides/zpkr82p/revision/2

Skeletal System—https://www.bbc.co.uk/bitesize/guides/zq3sbk7/revision/1

Cardiovascular System—https://www.bbc.co.uk/bitesize/guides/z9n6sg8/revision/1

Respiratory System—https://www.bbc.co.uk/bitesize/guides/ztkr82p/revision/1

Key Content: To be evidenced within this assignment

Key Content: Terminology

PASS CRITERIA.

Describe Give a detail account of something; think of it as painting a picture with words

Define To give a brief meaning of something

Outline A brief description of something that concentrates on the main topic or item

Illustrate Give examples or diagrams to help show what you mean

Identify Point out (choose the right one) or give a list of the main features or prove something as being certain

Interpret Give the meaning of something

Plan Write a plan of how you intend to carry out the activity

State Give a full account

Summarise Give the main points or essential features of an idea or a discussion; do not include unnecessary details that could confuse the main topic of concern

List A record that includes an item-by-item record of relevant information

MERIT CRITERIA.

Explain Give a detailed account to give the meaning of something with reasons; include the 'how' and 'why' of the topic of interest

Compare/Contrast Show the similarities between the two areas of interest and also the differences between the two, or the advantages and disadvantages

Discuss Examine the advantages and disadvantages of the subject of interest and then try to complete the discussion with a conclusion

Account for Explain the process or give a reason to explain the reason for something being the way it is

Demonstrate Give a number of related examples or details fro a variety of sources to support the argument you are making; in a practical situation, this means that you must practically carry out the activity or skill while being observed

Distinguish Explain the differences

Examine Inspect something closely

DISTINCTION CRITERIA

Analyse Explore the main ideas of the subject, stating how they are related, why they are important and how each one contributes to the main area of interest

Critically analyse Give your opinion of the subject of interest, both the advantages and disadvantages, after having considered all the evidence

Conclude After having given evidence to support your opinion or argument give a reasoned judgement

Assess Give your judgement on the importance of something

Criticise Analyse a topic or issues objectively – give both the advantages and disadvantages and then make a decision based upon the evidence you present

Evaluate Give evidence to support the good and bad points of the topic and then give your opinion based upon the evidence

Justify Give supported reasons for your view to explain how you have arrived at these conclusions