BTEC REVISION NOTES

TOP TIPS

EXPLAIN – GIVE A REASON FOR SOMETHING

DISCUSS – WRITE ABOUT SOMETHING FROM DIFFERENT POINTS OF VIEW LIKE WRITING ABOUT THE ADVANTAGES AND DISADVANTAGES

NAME/GIVE – GIVE A SHORT ANSWER

DESCRIBE – WRITE ABOUT WHAT SOMETHING IS LIKE

CALCULATE – YOU WILL NEED TO DO SOME MATHS TO WORK OUT YOUR ANSWER AND SHOW HOW YOU DID IT

INTERPRET – YOU NEED TO USE THE INFORMATION GIVEN TO WORK OUT THE ANSWER

PHYSICAL FITNESS

Cardiovascular (Circulatory) System move blood around the body and is made up of

1. Blood vessels
2. The heard
3. Blood

Respiratory system moves air into and out of the body. It is made of

1. The lungs
2. The airways

The two systems together make up the The **Cardiorespiratory** System

The oxygen we breathe and the nutrients we eat are transported around the body in the blood. Our cells used them to make **energy**. The **cardiorespiratory** system also allows the body to breath out waste products like **carbon dioxide.**

PHYSICAL FITNESS

AEROBIC ENDURANCE – The ability of the cardiorespiratory system to work efficiently, supplying nutrients and oxygen to working muscles during sustained (long lasting) physical activity.
MUSCULAR ENDURANCE – The ability of the muscular system to work efficiently and continue to contract over a period of time against a light to moderate load. E.g a tennis player holding their racket and playing throughout the game.
MUSCULAR STRENGTH – The maximum force (strength) that can be generated (made) by a muscle or muscle group.
FLEXIBILITY – Being able to move a joint fluidly (smoothly) through its complete (whole) range of movement
SPEED – Speed (m/s) = distance (m) / Time (s)
There are three types of speed

1. **Accelerative speed** – sprints up to 30 m
2. **Pure speed**- sprints up to 60 m
3. **Speed endurance**- sprints with a short recovery period (rest) in between

BODY COMPOSITION – The relative ratio (amount) of fat mass to fat-free mass in the body

SKILL – RELATED FITNESS

BALANCE – The ability to maintain centre of mass over a base of support

1. **Static Balance** – a still balance like a hand stand
2. **Dynamic Balance** – a moving balance like a cartwheel

POWER – The product (result) of speed x strength e.g. you need power to drive the ball in golf
AGILITY – The ability of a sports performer to quickly and precisely (exactly) move or change direction without losing balance or time
COORDINATION - The smooth flow of movement needed to perform a motor task efficiently (wasting as little energy as possible) and accurately (without going wrong)
REACTION TIME – The time that it takes for a sports performer to respond to a stimulus and initiate (start) their response.

Each sport needs different types of **physical** and **skill-related fitness.** You need to be able to identify the **types of fitness** needed for **different sports**. To do this, think about what the sports performers need to do in that sport.

TRAINING PROGRAM MES AND PRINCIPLES

TRAINING PROGRAM ME – a programme of exercise designed to improve performance.
There are **four** basic principles (guidelines) that a coach can follow

Frequency – How often to train per week

Intensity – How hard to train

Time – How long to train

Type – What training method (way of exercising) should be used to improve the type of fitness needed for the sport.

There are also seven more principles of training that a coach needs to think about

SPECIFICITY – Training should be linked to the sport, activity or physical/skill-related fitness goal
INDIVIDUAL DIFFERENCES/NEEDS – The programme should be designed to meet individual training goals and needs e.g. a fitter person would have a harder training programme
VARIATION – It is important to do different activities in training to the performer doesn't get bored
REST AND RECOVERY -A sports performer needs to rest to allow their body to recover. During recovery the body repairs any damage caused by exercise
PROGRESSIVE OVERLOAD - In order to progress (improve), training needs to be demanding enough to cause the body to adapt(change) to improve performance
ADAPTATION – How the body reacts to training loads by increasing its ability to cope with those loads
REVERSIBILITY – If training stops or the intensity of training is not sufficient (enough) to cause adaptation, training effects will be reversed.

HEART RATE

HEART RATE – The number of times the heart beats per minute (bpm)
MAXIMUM HEART RATE – also called **HR max**

HR max = 220 – age (years)

e.g. the maximum heart rate of a 25 year old is
HR max = 220 – age
= 220 – 25
= 195 bpm

HEART RATE TARGET ZONES

Heart rate needs to be high enough to cause adaptation and improve fitness
The target zone recommend to improve cardiorespiratory fitness is

TARGET ZONE = 60%-85% of HR max (a person's maximum heart rate)

WORKING OUT TARGET ZONES

1. Calculate maximum heart rate (HR max) or they might give it to you
   HR max = 220 – age (years)
2. Find **upper training threshold = HR max X 0.85**
3. Find **lower training threshold = HR max X 0.60**
4. Write down the lower heart rate followed by the higher heart rate to show the target zone

e.g. 220 – 25 (age) = 195 bpm
195 x 0.85 = 165.75 = 166 bpm (upper training threshold)
195 x 0.60 = 117 bpm (lower training threshold)
Target zone = 117 bpm – 166 bpm

BORG (6-20) RATING OF PERCEIVED EXERTION SCALE or the BORG (6-20) RPE Scale

6	No exertion at all
7	Extremely light
8	
9	Very light
10	
11	Light
12	
13	Somewhat hard
14	
15	Hard
16	
17	Very hard
18	
19	Extremely hard
20	Maximal Exertion

The numbers on the scale represent the **different levels** of **exercise intensity.**
The BORG (6-20) can be used to estimate a person's heart rate
HR (bpm) = RPE x 10
e.g. a perform says they are working extremely hard and give a RPE scale rating of 19 their estimated heart rate is
HR (bpm) = RPE X 10
= 19 X 10
= 190 bpm (beats per minute)

You can also estimate a RPE scale/Borg scale rating from a heart rate (bpm)
e.g. a performers heart rate is 154 (bpm)
RPE scale = HR (bpm) ÷10
= 154 ÷ 10
= 15.4
=15 RPE Scale

BTEC REVISION NOTES

TRAINING AND SAFETY

Fitness training methods are different ways of exercising. Each training method improves a different type of physical or skill-related fitness.

Advantages and Disadvantages
Each fitness training method has advantages and disadvantages like
VARIETY – is the training method interesting enough?
INTENSITY – is it easy to vary the intensity?
PURPOSE – does the training method improve the type of fitness you want it to?
COST – Does the training method needs lots of expensive equipment?
SPORT SPECIFIC – can the training method be changed to suit different sports?
SAFETY – Can the training method cause injury.
e.g. an advantage of stretching is that it increase flexibility. A disadvantage of stretching is that it can cause muscle soreness.

SAFETY –
Use equipment safely
Use training methods in the right way
Warm-up = (gentle exercise + stretching) **to increase heart rate and help prevent injury**
and **cool down =** (gentle exercise + stretching) **to decrease heart rate and stop muscles becomes sore.**

FITNESS TRAINING METHODS

FLEXIBILITY TRAINING – STRETCHING IS A FITNESS TRAINING METHOD

STRETCHING IMPROVES FLEXIBILITY

STATIC STRETCHING – is when you stretch a muscle and hold it in one position. There are 2 types of static stretching.

1. **ACTIVE** – This is where you use your own muscles to hold the stretch
2. **PASSIVE** – This is where you use someone or a piece of equipment to help you hold the stretch.

BALLISTIC STRETCHING – Is when you make fast movements (bounces). A disadvantage of this type of stretching is have it can strain (pull) your muscles or make them sore.

PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION (PNF)
You need a partner for PNF stretching

1. The performer stretches the muscle as far as it can go.
2. A partner helps hold the muscle in that position while the performer pushes back against the partner for 6-10s.
3. The performer relaxes.
4. So the partner can push the stretch a little further.

Muscles have a stretch reflex that stops them stretching too far. PNF works by stopping that reflex so the muscle can be stretched further. It improves mobility, strength and flexibility. It can help people to recover from injuries.

FITNESS TRAINING METHODS

STRENGTH TRAINING

FREE WEIGHTS – are weights that are not attached to a machine
You can use free weights to improve **MUSCULAR STRENGH** AND **MUSCULAR ENDURANCE**
You can target particular muscles
You can injury yourself if your technique is wrong

There are two types of exercise with **free weights**
CORE EXERCISES – These wort muscles that make the spine and pelvis stable
ASSISTANCE EXERCISES – These work muscles that are specific to a sport or exercise

Always do **core before assistance** exercises
Change between **upper and lower** body exercises
Change between **push and pull** exercises

Weight training is done in **REPS** – one specific exercise and **SETS** – the number of reps you do without a rest
1RM – one repetition maximum – is the heaviest amount you can lift in one rep
The intensity of training can be described as a percentage of 1RM

MUSCULAR STRENGTH	STRENGTH ENDURANCE	ELASTIC STRENGH
High loads and low reps	Low loads and high reps	Medium loads and medium reps
90% 1RM and 6 reps	50-60% 1RM and 20 reps	75% 1RM and 12 reps

FITNESS TRAINING METHODS

SPEED TRAINING – going as fast as you can for a short distance and then having lots of rest.

HOLLOW SPRINTS – do more than one sprint with a jog or walk in between called the hollow period
INTERVAL TRAINING – do a period of work and a period of rest and recovery. To work on Speed you need periods of higher intensity (close to maximum) for a short time. You can increase the number of rest or recovery periods. E.g. run for 15 seconds as fast as you can and then recover for 3 minutes.
ACCELERATION SPRINTS – you keep increasing the pace over a short distance. You can start either standing still or rolling (easy jogging) and slowly get faster. In between each acceleration sprint you rest by walking or jogging slowly.
You can make acceleration sprints harder by doing
HILL SPRINTS
RESISITANCE DRILLS

COACHES NEED TO MATCH TRAINING METHODS TO SPORTS AND USE THE PRINCIPLES OF TRAINING TO GUIDE THEIR PLANNING.

FITNESS TRAINING METHODS

AEROBIC ENDURANCE TRAINING - Increasing how long you can exercise for

CONTINUOUS TRAINING – is where you keep doing the same exercise without any rest for at least 30 minutes. You keep at a steady pace and at moderate (medium) intensity so you don't go too fast.
FARTLEK TRAINING – involves changes in intensity with no rest. You can change the intensity by

1. changing the speed
2. changing the steepness of the ground
3. adding weight

Advantages are that you can make it hard or easy to match a performers INDIVIDIUAL NEEDS. You can use it in lots of different activities like running, cycling and rowing.
INTERVAL TRAINING – This involves periods of working and resting. Work usually ranges between 30 seconds and 5 minutes. Rest period can include sit down, stand still, walk or jog. To improve aerobic endurance you need to have longer more intense periods of working and shorter breaks.
VO2 max = the maximum amount of oxygen uptake. It is the largest amount of oxygen that your body can use every minute. Measured in ml of oxygen per kg of body mass per minute (ml/kg/min).
The intensity of training can be measured as a percentage of VO2 max.
CIRCUIT TRAINING – You can adapt a circuit to work on aerobic endurance for example using exercises like skipping and shuttle runs. You can increase the time spend at each station and the frequency of training.

FITNESS TRAINING METHODS

STRENGH TRAINING

CIRCUIT TRAINING FOR STRENGTH
You can use circuit training to improve muscular strength, power and muscular endurance. You can also adapt a circuit to work on skills like agility and coordination or to work on aerobic endurance.
In circuit training you do different exercises one after another.

- Each exercise is called a station.
- You normally have 6-10 different stations.
- All the stations make up one circuit.
- You need to put the exercises in an order that doesn't work the same muscles straight after each other to stop the muscles getting too tired.

PLYOMETRICS FOR EXPLOSIVE POWER AND MUSCULAR STRENGTH.

The exercises are linked to the sport
The performer uses **maximal force** (as much power as possible). This force is needed to lengthen and then quickly shorten the muscle for example two footed jumping over hurdles.
The working muscle lengthens when you land this is the **eccentric action**
The working muscle shortens quickly when you jump this is the **concentric action**
Used by sprinters, hurdlers, and team games where jumping is important like netball, volleyball and basketball. The disadvantage is that is can make muscles sore.

BTEC REVISION NOTES