Year 11 GCSE PE Autumn Knowledge Organiser

Component 1 Principles of Training

Principles of training: F I R S T O P

Principle	Explanation	Application
F.I.T.T	F = Frequency (how often) I = Intensity (how hard) T = Time (how long) T = Type of training	I train 3 times per week 3 sets of 8 reps of 15kg I train for 60 minutes I use circuit training
Individual Needs	Everybody is different and has different needs. It is important to match training to the requirements of the individual	Ronaldo is a professional footballer he trains 5 days per week. John plays Sunday league football and trains once per week
Reversibility	Just as football improves with training, it can decline if you stop training	Reversibility can be caused by lack of training or injury
Specificity	raining must match the requirements of the activity so that the right muscles and body systems are adapted	A sprinter should train for speed A rower should train using a rowing machine not a treadmill
Thresholds of Training	To improve fitness, you should train within your target zone. Your target zone will depend on the intensity of the activity Aerobic = 60 – 80% max HR Anaerobic = 80 – 90% max HR	Running a 10k is an aerobic activity. You should therefore train in the aerobic training zone of 60 – 80% of the max heart rate
Overtraining	Too much training can lead to injury and prevent improvement. Rest, duration of a session and the intensity are all important when training	Training everyday does not allow enough time for rest for recovery and adaptations
Progressive Overload	Progressive overload is gradually increasing the amount of training so that fitness gains occur, but without the risk pf injury	Week 1 = run for 10 mins Week 2 run for 15 mins

Thresholds of training

Aerobic training zone = 60 – 80% of max HR

Anaerobic training zone = 80 – 90% of

The Karvonen formula

Maximum Heart rate = 220 - Age

Worked example

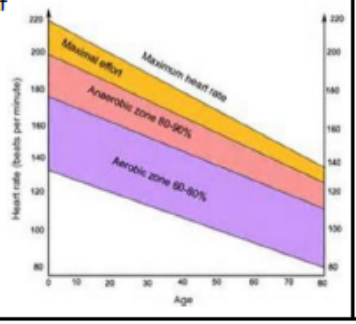
John is 16 years old

His maximum heart rate = 204 bpm

Aerobic training zone = 60 -80 %

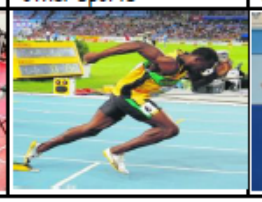
60% = 60 x 204 ÷ 100 = 122 bpm

80% = 80 x 204 ÷ 100 = 163 bpm



Component 1 Types of Training

Types of Training

Continuous Training	Fartlek Training	Circuit Training	Interval Training	Plyometric Training	Weight Training
Is aerobic Has no breaks or rest (20 min or more) Sub-maximal exercise Improves cardiovascular & muscular endurance	Form of continuous training Varies in pace and terrain Aerobic & Anaerobic Improves cardiovascular & muscular endurance	Contains stations organised in a circuit they can be skill or fitness based, aerobic or anaerobic Intensity is measure by circuits, time or repetitions	High intense exercise followed by periods of rest to recover Usually anaerobic can be used in a variety of locations Improves speed but can improve strength and cardiovascular	High Intensity Short duration Breaks between sets (exercises) Involves jumping/bounding Improves power (speed & strength)	Form of interval training Involves reps and sets Weight provides the resistance Improves strength, power and muscular endurance
Advantages	**Advantages**	**Advantages**	**Advantages**	**Advantages**	**Advantages**
No equipment or facilities Has many health benefits (CHD)	No equipment or facilities Change of pace can be more interesting	Variety of stations generates interest Can be skill or fitness Can easily be adapted	Can be used to improve health and fitness (aerobic & anaerobic) No equipment needed	Develops power quickly No equipment	Can target specific areas of the body Easily adapted for different fitness'
Disadvantages	**Disadvantages**	**Disadvantages**	**Disadvantages**	**Disadvantages**	**Disadvantages**
Boring No change of pace Can cause impact injuries	High intensity can be avoided A safe route may be hard to find	Equipment can be costly Can be time consuming to set up	Can be repetitive and boring Need to plan and keep track of sets	Can cause injury due to high intensity	Can cause injury with poor technique A spotter needed with free weights
Sports	**Sports**	**Sports**	**Sports**	**Sports**	**Sports**
Marathon running cycling swimming	Fotball Rugby Netball	Can be adapted to suit all sports	Usually for speed It can be adapted to other sports	Basketball Long jump Hurdles	Weight lifting rugby shot-put
					

Aerobics

- Involves continuous activity between 30 – 60 minutes, includes step and aqua aerobics
- Improves Cardiovascular fitness

Body Pump

- Moderate to high intensity, lots of reps & uses barbells
- Improves strength & muscular endurance

Pilates

- Exercises done on a mat, uses resistance and focuses on core strength
- Improves flexibility, balance & strength

Yoga

- Exercise done on a mat
- including relaxation & breathing techniques
- Improves flexibility, balance & strength

Spinning

- Continuous cycling to music
- Improves muscular endurance & cardiovascular fitness

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Component 1 Effective Use of Warm-up & Cool-down

Warm-up

A warm-up has three phases:

Warm-up

Phase 1 Pulse raiser
To raise the heart rate and speed up oxygen delivery to the working muscles. E.g. jogging a lap of the pitch

Phase 2 Stretching
Stretching the muscles and soft tissues you are about to use increases their elasticity and range of movement

Phase 3 Drills
These are more intense practices relating to the main session, such as dribbling if you are playing basketball

Why we warm-up

- To physical and mentally prepare for exercise
- To increase oxygen delivery to the working muscles
- Increase temperature of muscles, tendons, and ligament. Reducing the chance of injury
- Increase flexibility which will aid performance prepare for exercise

Cool-down:

A cool down has two phases:

Cool-down

Phase 1 Light exercise
e.g. slow jogging at a much lower intensity you have been working

Phase 1 Stretching
Stretch the muscles you have used in the main activity

Why we cool-down

- The removal of lactic acid
- The removal of carbon dioxide
- Bring heart and breathing rate slowly back to resting
- Helps avoid dizziness due to blood pooling
- Improves flexibility

A cool down is **NOT** designed to prevent injury it is to return the body to its resting levels

Component 1 Use of Data

The use of data

Data can be collected in many ways

- Data can be collected on the quality that you see, e.g. how well a skill is performed (qualitative)
- Data can be collected based on numbers e.g. how many press-ups completed (quantitative

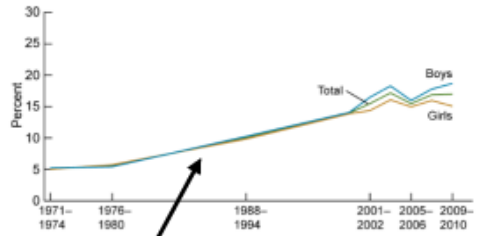
Tables:

Below is a table showing lots of data in a normative table for a 12-minute cooper run test. There are lots of numbers, all you have to do is locate the age group and the score. For example, a 17-year-old scored 1750m

Age	Excellent	Above Average	Average	Below Average	Poor
13-14	>2000m	1900-2000m	1600-1899m	1500-1599m	<1500m
15-16	>2100m	2000-2100m	1700-1999m	1600-1699m	<1600m
17-20	>2300m	2100-2300m	1800-2099m	1700-1799m	<1700m
20-29	>2700m	2200-2700m	1800-2199m	1500-1799m	<1500m
30-39	>2500m	2000-2500m	1700-1999m	1400-1699m	<1400m
40-49	>2300m	1900-2300m	1500-1899m	1200-1499m	<1200m
>50	>2200m	1700-2200m	1400-1699m	1100-1399m	<1100m

Trends:

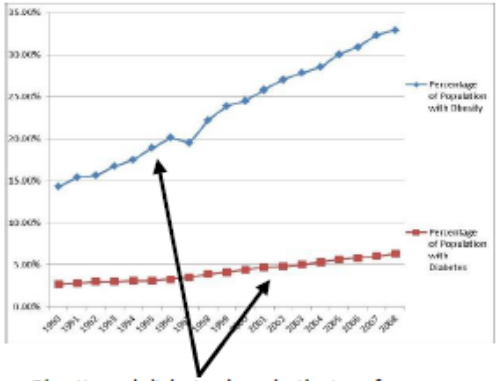
Below is a graph showing trends in obesity of young children aged 2-19. You need to analyse the date and identify the trends in data.



The overall trend is that obesity is rising steadily from 1971-1974 to 2009-2010. It has risen from 5% to 15%. Boys are more obese than girls

Graphs and Charts

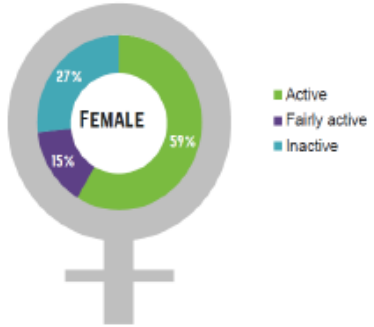
Some information that happens over time will be represented as a line graph, such as the correlation between obesity and diabetes over time



Obesity and diabetes have both risen from 1990-2008.

Obesity levels have risen at a greater rate than diabetes

If you are trying to compare parts of a whole you may use a pie chart such as a pie chart to show the percentage of women who are active, fairly active and inactive.



59% of females are active

15% are fairly active

27% are inactive

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Component 1 How to Optimise Training and Prevent Injury

Injury prevention:

Injury prevention	Explanation
PAR-Q	Identify potential health risks such as high blood pressure
Allow recovery time	Prevent overuse injuries by allowing time to rest and recover
Warm-up	Increases elasticity of muscles
Use correct clothing	Clothing can protect different parts of our body
Apply the rules	Rules are there to protect performers from injury
Use correct equipment	Equipment should be checked and appropriate for the age group
Check Equipment	Equipment should be checked so that faulty or inappropriate does not cause injury
Check facilities	Facilities should be checked and to remove obstacles from the playing area
Apply principles of training	Ensure you use progressive overload and are working at the correct intensity & allow rest
Balanced competition	Competition should be balanced in age, weight, skill and sex

Application

Check Equipment
When playing plays must check the correct equipment such as padded goal posts. The padded posts reduce the chance of injury if a player runs or fall into them

Correct Clothing
Player wears a gum-shield to protect their teeth

PAR-Q
Before the player trains they will fill in a PAR-Q to highlight any health problems

Allow Recovery Time
After the match the player will rest to allow recovery and adaption. This prevents overuse injuries

Warm-Up
Player warms up before they play to ensure the elasticity of muscle so they are less likely to pull or stain them

Apply the Rules
Player are not allowed to tackle above the shoulder this prevents injuries to the head such as concussion

Check Facilities
Before you play obstacles such as broken glass should be removed from the pitch

Use Correct Equipment
Players should use the correct sized and weight of ball to reduce the chance of injury

Balanced Competition
Player will only play against his own age, sex, ability

Apply Principles of Training
Players should use the correct sized and weight of ball to reduce the chance of injury

Fractures:

Compound	Simple	Greenstick	Stress
			
Compound or open fractures are when the bone is broken and causes the skin to break	Simple or closed fractures are when the bone is broken but does not break the skin	Greenstick fracture is where the bone breaks at one side and bends on the other. They are common in cildren	Stress fractures is where there is a small crack in the bone usually casused through overuse

Symptoms	Treatment
• Pain • Bruising • Swelling • Misshapen limb	Need to be treate by a doctor who will make sure the bone is properly aligned and imobilised unitil it has healed

A fracture is cause when a force on the bone is greater than the bone itself. A fracture can be caused by a tackle in rugby, or falling from a height in basketball

R.I.C.E.

 1. Rest	Do not use the injured area, allowing time to heal and to prevent further damage
 2. Ice	The cold from the ice will help reduce swelling and pain by constricting the blood vessels. Do not apply ice direct onto the skin and not for too long
 3. Compress	Apply a bandage to the area to help reduce swelling and provide support. Make sure the bandage is not too tight
 4. Elevate	Keep the affected area raise to reduce swelling by reducing the blood flow

Injuries:

Sprain

A sprain is a soft tissue injury where some of the fibres of the ligament are torn

Symptoms	Treatment
• Pain • Bruising • Swelling	• Rest • Ice • Compression • Elevation

A sprain can occur during a twisting or overstretching the joint

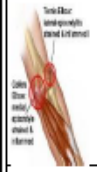
Strain

Strains are a soft tissue injury and is a stretch or tear to the muscle. Sometimes known as a pulled muscle

Symptoms	Treatment
• Pain • Bruising • Swelling	• Rest • Ice • Compression • Elevation

A strain occur due to overstretching

Tennis/Golfers Elbow



Tennis/golfers elbow is a joint injury where the tendons are inflamed. Tennis elbow the pain is felt on the outside of the elbow Golfers elbow the pain is felt on the inside

Symptoms	Treatment
• Pain • Swelling	• Rest • Ice • Compression • Elevation

Tennis and golfers elbow are caused by overuse

Torn Cartilage

Cartilage act as cushion at the ends of bones. Torn cartilage is an injury where small tears appear in the cartilage

Symptoms	Treatment
• Pain • Swelling • Stiffness at the joint	Rest and strengthening exercises

Torn cartilage can happen when you twist forcefully, sudden impact/stopping

Abrasions

Abrasions are minor injuries to the skin and include cuts and grazes

Symptoms	Treatment
• Pain • Swelling	Abrasions must be cleaned & covered with a sterile dressing. Pressure should be applied if bleeding

Abrasions can occur in any activity due to a knock or a fall

Concussion

Concussion is a mild head/brain injury. It is caused by a blow to the head or by whiplash shaking the brain inside the skull

Symptoms	Treatment
• Confusion • Dizziness • Unconsciousness • Nausea	Seek medical advice and monitor closely to make sure the symptoms do not get worse

Concussion is common in contact sports such as rugby when getting tackled

Dislocation

Dislocation is where one of the bones at a joint comes out of place, e.g. shoulder, knee finger

Symptoms	Treatment
• Pain • Misshapen joint • Swelling	Seek medical advice because of possible damage to surrounding nerves

Dislocations are often caused by a fall or a blow to the area.