



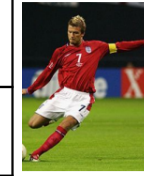
# Year 11 Health & Fitness Spring Knowledge Organiser

## Health Component Of Fitness



Component	Definition	Sporting Example	Test
Muscular Endurance	The ability of a muscle group to repeat a movement for a prolonged period.	Push Ups in Circuit Training	Sit Up Test
Flexibility	Range of movement around a joint.	Splits in Gymnastics	Sit and Reach
Body Composition	Describes the percentage of fat, bone, muscle and water in the body.	Endomorph- sumo wrestling Mesomorph- swimming Ectomorph- marathon running	Skinfold Caliper Test
Muscular Strength	The amount of force a muscle can exert against a resistance.	Weightlifting	Hand Grip Dynamometer
Cardiovascular Endurance	The ability to exercise the whole body for prolonged periods. This involves the cardio (heart) and vascular (blood vessels).	Running at the end of a netball match	12 minute cooper run

## Sport/ Skill Component Of Fitness



Component	Definition	Sporting Example	Test
Agility	The ability to change the position of the body quickly and to control the movement of the whole body	Rugby player dodging a defender	Illinois Agility Run
Balance	The ability to retain the centre of mass over the body above the base of support	Handstand in Gymnastics	Standing Stork
Coordination	The ability to use two or more body parts together	Batsman striking the ball in cricket	Hand Wall Toss Test
Power	The ability to undertake strength performances quickly Strength x Speed =	The jump phase of the Long Jump	Standing Long Jump
Reaction Time	The time in between stimulus and the onset of movement	A sprinter responding to the start gun	Ruler Drop
Speed	The rate at which an individual is able to perform movement.	Running the 100m	30 metre sprint

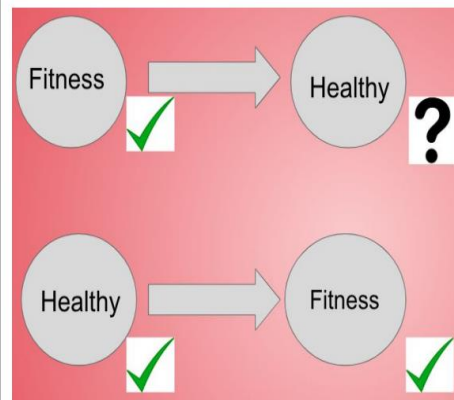
**F – FREQUENCY**    how often you train  
**I – INTENSITY**    how hard you train  
**T – TIME**    how long you train  
**T – TYPE**    type of activity you do

## Health and Fitness

**Definitions**

Health - a state of complete physical mental and social well being, not merely the absence of disease.

Fitness - the ability to meet the demands of the environment.



You can be fit and not healthy because you might not have social and mental health.

To be healthy you have to be fit because you need to have the physical side.

- S – SPECIFICITY**
- P – PROGRESSION**
- O – OVERLOAD**
- R – REVERSIBILITY**
- T – TEDIUM**

- SPECIFICITY- making the training specific to the needs of the sport or individual.
- PROGRESSION- gradually increasing the training that you are doing.
- OVERLOAD- doing more training
- REVERSIBILITY- any training gains can be lost if training does not continue.
- TEDIUM- training needs to keep the athlete motivated.





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## Diet and Energy Balance

**Balanced diet** - Eating the right foods in the right amounts. This will allow us to exercise and work properly

**Varied diet** - If we don't eat a variety of foods in the correct proportions, we won't get all the nutrients we need to make up a balanced diet



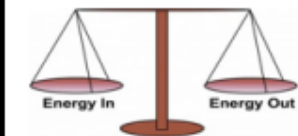
The Eatwell guide shows us what foods we should be eating and in what quantities. E.g. the largest parts of the diet should come from:

- Fruit & Vegetables
- Starchy carbohydrates

Variety is important to get all the necessary nutrients. There are seven nutrients.

- Carbohydrates
- Fats
- Proteins
- Vitamins
- Minerals
- Fibre
- Water

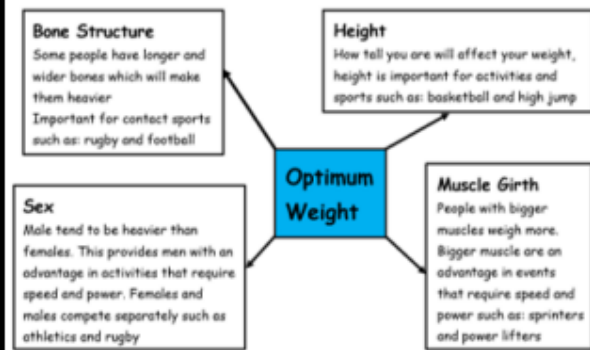
## Energy Balance



The energy balance makes sure the calories we take in is equal to the number of calories we expend.

- If we take in more calories, we will gain weight
- If we take in too little calories, we will lose weight
- We need to have a balance so we have the correct nutrients for energy

## Optimum Weight



## Dietary Manipulation

### Protein intake:

Protein should be consumed as soon as possible after exercise; this increases protein synthesis and therefore muscle growth. This is used by performers such as sprinters, shot putters and power lifters

### Carbohydrate loading:

This strategy involves eating foods high in carbohydrates 1 to 4 days before an event. These increases glycogen stores in the muscle. This is used by endurance athletes such as marathon runners

### Hydration:

Water prevents dehydration, dehydration causes: dizziness, fatigue, heat stroke, muscle cramps, nausea and the thickening of blood. Water should be consumed before during and after exercise

## Macronutrients

### Carbohydrates

#### Function:

- Provide us with energy in both aerobic and anaerobic activities
- Eaten in large quantities compared to other macronutrients

#### Found in:

- Bread, rice, pasta, potatoes



### Fats

#### Function:

- Provide us with energy, is stored in the body and can lead to weight gain
- Should be the smallest percentage of macronutrients in the diet

#### Found in:

- Butter, oil, fatty meats, fried food



### Proteins

#### Function:

- Used for growth and repair, it can provide us with energy
- May be used by athlete for growth and repair of muscles

#### Found in:

- Cheese, milk, eggs, lean meat, fish



## Micronutrients

### Vitamins & Minerals

- Vitamins and minerals keep our body healthy and can improve your immune system,
- Vitamins are found in fresh fruit and vegetables
- Minerals are found in vegetables and meat

**Vitamin D:** Found in dairy products and helps the body absorb calcium

**Calcium:** Found in milk and other dairy products and helps keep our bones strong



### Water

- Water prevents dehydration and is found in most liquids and many foods



### Fibre


- Fibre aids the digestive system and is found in foods such as cereals, vegetables and nuts






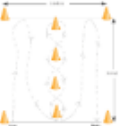
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**Muscular Strength**  
**Test:** Hand Grip Dynamometer Test  
**Protocol:** Grip the dynamometer in one hand. Start with your hand up and bring down to side while pulling in handle. No swinging your hand.




Advantages	Disadvantages
<ul style="list-style-type: none"> <li>Simple and easy to complete</li> </ul>	<ul style="list-style-type: none"> <li>Only one size of dynamometer which may affect reading.</li> <li>Focuses solely on forearm strength.</li> </ul>

**Agility**  
**Test:** Illinois Agility Test  
**Protocol:** Start lying down at the start line. Complete course as quick as possible (10m x 5m – 4 central cones)





Advantages	Disadvantages
<ul style="list-style-type: none"> <li>Simple and easy to complete</li> </ul>	<ul style="list-style-type: none"> <li>Motivation dependant / Timing errors.</li> </ul>

**Muscular Endurance**  
**Test:** 1 minute sit up test  
**Protocol:** Complete as many full sit ups/press ups as possible in 1 minute.




**Test:** 1 minute press up test  
**Protocol:** Complete as many full sit ups/press ups as possible in 1 minute.




Advantages	Disadvantages
<ul style="list-style-type: none"> <li>Simple test to complete</li> <li>Minimal equipment needed.</li> </ul>	<ul style="list-style-type: none"> <li>Difficult to assess whether each repetition is performed correctly. Difficult to accurately measure large groups.</li> </ul>

**Speed**  
**Test:** 30m Sprint Test  
**Protocol:** Start from stationery position. Complete distance in the quickest possible time. Time is stopped when chest crosses the line.




Advantages	Disadvantages
<ul style="list-style-type: none"> <li>Quick test to complete.</li> <li>Minimal equipment needed and can be performed anywhere with a flat 50m run.</li> </ul>	<ul style="list-style-type: none"> <li>Running surfaces/weather conditions can affect the results.</li> <li>Inaccuracies with stopwatch usage.</li> </ul>

**Flexibility**  
**Test:** Sit and Reach Test  
**Protocol:** Sit with legs straight out in front and soles of feet against box/table. Reach forward without bending knees. No jerking movements.




Advantages	Disadvantages
<ul style="list-style-type: none"> <li>Quick and easy to perform.</li> <li>Data table readily available for comparison</li> </ul>	<ul style="list-style-type: none"> <li>Can cause injury if not fully warmed up appropriately.</li> <li>Only measures flexibility of lower back and hamstrings.</li> </ul>

**Power**  
**Test:** Vertical jump Test  
**Protocol:** Stand next to wall and mark an initial reach while feet are flat on the ground. Standing jump to reach as high as possible. Measure distance from first mark to second.




Advantages	Disadvantages
<ul style="list-style-type: none"> <li>Quick and easy to perform.</li> <li>Easy to complete with large groups.</li> </ul>	<ul style="list-style-type: none"> <li>Technique plays a large role in successful completion.</li> </ul>

**Cardiovascular Fitness (Aerobic Endurance)**  
**Test:** 12 min Cooper Run  
**Protocol:** Continuously run/swim for 12 minutes. Distance recorded.



Advantages	Disadvantages
<ul style="list-style-type: none"> <li>Minimal equipment needed</li> <li>Test can be self administered.</li> </ul>	<ul style="list-style-type: none"> <li>Inaccuracy of heart rate measurements</li> <li>Motivation dependant</li> </ul>


**Reliability /Validity**  
**Validity** relates to whether the test actually measures what it sets out to measure.  
**Reliability** is a question of whether the test is accurate. It is important to ensure that the procedure is correctly maintained for ALL individuals.



**Results can be improved:**

- By using experienced testers & calibrating equipment
- Ensuring performers have the same level of motivation to complete each test
- Repeatedly test to avoid human error (x3)

**Test:** Harvard Step Test  
**Protocol:** Step continuously for 5 minutes. Measure heart rate at 1, 2 and 3 minutes after exercise.



Advantages	Disadvantages
<ul style="list-style-type: none"> <li>Simple test to complete</li> </ul>	<ul style="list-style-type: none"> <li>Motivation dependant</li> </ul>



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Warm up and cool down
<p><b>Warming up should include:</b></p> <ul style="list-style-type: none"> <li>gradual pulse raising activity</li> <li>stretching</li> <li>skill based practices/familiarisation</li> <li>mental preparation</li> <li>Increase amount of oxygen and blood to the working muscles</li> <li>Increase in mobility through full range of movement at the joints</li> <li>Dynamic movements</li> <li>The speed of muscle contraction</li> </ul> <p><b>Cooling down should include:</b></p> <ul style="list-style-type: none"> <li>Low intensity exercises</li> <li>maintain elevated breathing and heart rate, eg walk, jog</li> <li>gradual reduction in intensity</li> <li>stretching</li> </ul> <p><b>The benefits of warming up:</b></p> <ul style="list-style-type: none"> <li>effect on body temperature</li> <li>range of movement increased</li> <li>psychological preparation</li> <li>practice of movement skills through the whole range of movement</li> <li>Injury prevention.</li> <li>Increased blood flow and O<sub>2</sub> to the muscles</li> </ul> <p><b>The benefits of cooling down:</b></p> <ul style="list-style-type: none"> <li>allowing the body to recover</li> <li>the removal of lactic acid/CO<sub>2</sub>/waste products</li> <li>Prevent delayed onset of muscle soreness (DOMS) - the pain felt in the muscles the day after exercise.</li> <li>Lowers heart rate</li> <li>Circulation of blood and O<sub>2</sub></li> <li>Lowers body temperature</li> <li>Aids recovery by stretching muscles</li> </ul>

Types of training			
<p><b>Circuit training</b> A series of exercise stations whereby periods of work are interspersed with periods of rest. The content/demand of the circuit can be altered in order to improve different components of fitness.</p>	<p><b>Continuous training</b> Sustained exercise at a constant rate (steady state) without rests, involving aerobic demand for a minimum of 20 minutes, eg running, swimming, rowing, cycling. It improves cardio-vascular fitness. Sometimes referred to as a steady state training. Appropriate to marathon runners.</p>	<p><b>Fartlek training</b> Swedish for 'speed play'. Periods of fast work with intermittent periods of slower work. Varying speed, terrain and work:rest ratios. Often used in running; sprint, jog, walk, jog, sprint, etc.</p>	<p><b>High intensity interval training (HITT)</b> Alternating periods of short intense anaerobic exercise with less intense recovery periods</p>
<p><b>Weight training</b> The use of weights/resistance to cause adaptation of the muscles. Chose appropriate weight/exercise depending on fitness aim, eg strength/power training or muscular endurance</p>	<p><b>Weight training</b> <b>One rep max:</b> The maximal amount that can be lifted in one repetition by a muscle/group of muscles (with the correct technique). <b>Repetitions:</b> The number of times an individual action is performed. A set is a group of repetitions.</p>	<p><b>Interval training</b> Periods of training/work that are followed by periods of rest or low intensity exercise.</p>	<p><b>Plyometric training</b> Use of plyometric exercises eg bounding, depth jumping, to increase power. It includes an eccentric contraction (lengthening of the muscle) followed by larger concentric contraction (shortening of the muscle).</p>

## PARQ

A PARQ is a Physical Activity Readiness Questionnaire:

- One of these should be completed by anyone who is wishing to undertake a new physical training programme.
- It is a self-screening/ assessment tool to indicate any potential reasons why someone may not be suited to training, or particular activities.
- It looks at medical and injury history.
- It is designed to try and help highlight any possible underlying health issues.
- May also look at emotional, mental and social factors affecting the participant, especially those which might impact on them performing regular exercise in public spaces or gyms.
- It asks the participant for general health information, usually around diet, alcohol consumption, smoking history.
- Typically used by personal trainers or sports coaches to help determine the suitability and safeness of a client or player taking part in a training programme.