



# Components of Fitness

## Teacher Answer Booklet



	<b>Description from Specification</b>	<b>Pupil comments – How confident do you feel on this topic?</b>
Health and fitness	Definitions of health and fitness.	
The relationship between health and fitness The relationship between health and fitness.	Decreased fitness because of ill health, ie poor health can result in an inability to train, lowers fitness. Increased fitness despite ill health, ie unhealthy but able to train, increases fitness.	
The components of fitness	Definitions of the following components of fitness: agility, balance, cardiovascular endurance (aerobic power), coordination, flexibility, muscular endurance, power/explosive strength (anaerobic power), reaction time, strength (maximal, static, dynamic and explosive), speed.	
Linking sports and physical activity to the required components of fitness	Understand and justify why the components of fitness (as stated above) may or may not be needed when performing certain physical activities and sports.	

## **Health & Fitness:**

Health -

A state of complete emotional, physical and social well-being, and not merely the absence of disease and infirmity

Fitness -

The ability to meet the demands of the environment

**Name a sport that you regularly participate in:**

Cricket

Do you need to be healthy in order to take part in this sport?

Emotional health is required as the concentration required when batting or bowling would be hard to accomplish if stressed or anxious.

Physical health is required as the game is difficult to play effectively if suffering from illness or infirmity.

Social health is required in order to successfully discuss tactics with teammates.

Would ill health effect your ability to train or improve in this sport?

Poor physical, mental or social health would all have an effect in the ability to train in cricket and this would in turn effect performance.

What are the fitness demands of this activity?

To be able to stand in the field for long periods of time and to show the required speed cardiovascular fitness to run between the wickets and to bowl effectively.

**Name – Tyson Fury**

**Facts:**

- Height: 6ft 9in
- Weight: 126kg
- Age: 33
- Married with 6 children
- Professional Boxer and World
- Suffered with depression in the past



**Using the information given, answer the questions shown below using your own opinion (there is no right or wrong answer!).**

**Is this person healthy?**

*This answer will be based on opinion.*

**Is this person fit?**

*This answer will be based on opinion.*

**Does this person show a good performance in their sport?**

*This answer will be based on opinion.*

**Name – Ronnie O’Sullivan**

**Facts:**

- Age: 46
- Snooker Player
- World Champion on Several Occasions
- 3 children (from different relationships)
- Suffered with addiction in the past



**Using the information given, answer the questions shown below using your own opinion (there is no right or wrong answer!).**

**Is this person healthy?**

*This answer will be based on opinion.*

**Is this person fit?**

*This answer will be based on opinion.*

**Does this person show a good performance in their sport?**

*This answer will be based on opinion.*

Hint – Make sure you know the definitions for all 10 components of fitness

## Components of Fitness:

There are 10 components of fitness which help athletes to stay fit and healthy, as well as improving their skill level.

### 1. Cardiovascular Endurance (Aerobic Power)

Definition	The ability to exercise the whole body for long periods of time
Sporting Example	Marathon Running
How I use it in my sport	Individual Pupil Answer

### 2. Strength

Definition	Your ability to exert force against a resistance
Sporting Example	Weightlifting
How I use it in my sport	Individual Pupil Answer

### 3. Muscular Endurance

Definition	The ability of a muscle or muscle group to undergo repeated contractions avoiding fatigue.
Sporting Example	Cycling
How I use it in my sport	Individual Pupil Answer

### 4. Flexibility

Definition	The range of motion of your joints or the ability of your joints to move freely
Sporting Example	Swimming
How I use it in my sport	Individual Pupil Answer

### 5. Agility

Definition	The ability to control the movement of the whole body and change position quickly
Sporting Example	Rugby (Side-Step)
How I use it in my sport	Individual Pupil Answer

## 6. Balance

Definition	Being able to keep the body stable, while at rest or in motion
Sporting Example	Gymnastics
How I use it in my sport	Individual Pupil Answer

## 7. Coordination

Definition	The ability to use two or more body parts together
Sporting Example	Tennis
How I use it in my sport	Individual Pupil Answer

## 8. Power/Explosive strength (Anaerobic power)

Definition	The ability to undertake strength performances quickly (strength x speed)
Sporting Example	100m Sprint
How I use it in my sport	Individual Pupil Answer

## 9. Reaction Time

Definition	The time between the presentation of a stimulus and the onset of movement
Sporting Example	Badminton
How I use it in my sport	Individual Pupil Answer

## 10. Speed

Definition	The rate at which an individual can perform a movement or cover a distance
Sporting Example	Football (Striker)
How I use it in my sport	Individual Pupil Answer

## Strength

Strength can be divided into four types. Whilst they all require an individual to exert force against resistance, the strength is applied in different **motions**.

- 1. Maximal Strength** - the **absolute maximum/largest force** that can be generated in a single contraction.
- 2. Static Strength** - the ability to **hold a body part in a static position**.
- 3. Dynamic Strength** – the ability of a body part to repeatably exert force (closely related to **muscular endurance**).
- 4. Explosive Strength** – the product of strength and speed (also known as **power**).

How can you describe action of muscles in the following types of strength?

Static strength – **Muscles contract and hold one position**

Dynamic strength – **muscles repeatably contracting and extending**

Explosive strength – **muscle contracts at a high speed**

Identify the type of strength the following sporting activities require.



Rugby Scrum – **static strength**



Rowing – **dynamic strength**



Volleyball spike – **explosive strength**



Single boxing punch – **maximal strength**



Fill in the tables below, ensuring that you mention each component of fitness at least once.

Activity - Football	
Component of Fitness	Explain why this is important
Muscular Endurance	A player must use the quadriceps repeatedly to take shots throughout the match
Speed	Required to beat a defender to the ball
Coordination	Foot-eye coordination is used for passing and shooting

Activity – Marathon Running	
Component of Fitness	Explain why this is important
Muscular Endurance	Gastrocnemius and quadriceps must be used repeatedly for a number of hours during the race
Cardiovascular Endurance	The heart and lungs must work for a long period of time to supply oxygen

Activity - Tennis	
Component of Fitness	Explain why this is important
Coordination	Hand-eye coordination must be used to play effective shots
Reaction Time	Players must react to the stimulus of the ball as it comes over the net
Power	A serve requires strength and speed working together

## Activity – Weight Lifting

Component of Fitness	Explain why this is important
Power	Strength and speed must combine to lift the heaviest weight possible
Strength	Strength is required in order to work against a heavy resistance

## Activity – Cycling

Component of Fitness	Explain why this is important
Muscular Endurance	The quadriceps must repeatedly work incredibly hard, particularly when cycling up a hill or mountain
Cardiovascular Endurance	The heart and lungs must work together for long periods throughout a race
Speed	Track cyclists often work for short periods with their legs working at a very high speed

## Activity – Gymnastics

Component of Fitness	Explain why this is important
Balance	Events such as the beam require exceptional balance in order to produce twists and turns
Flexibility	This will allow performers to show aesthetically pleasing body shapes and performances

## Exam Question

Hint – Consider the wording of the question carefully – what does 'relative' mean?

Cricket is a sport that requires a number of components of fitness.

Evaluate the relative importance of co-ordination and agility in cricket. (6)

A01 = 1, A02 = 2, A03 = 3



### A01 – Knowledge of the components of fitness given.

- Coordination is the ability to use two or more body parts together.
- Agility is the ability to control the movement of the whole body and to change position quickly.

### A02 – Application to cricket.

- Hand-eye hand-eye coordination is used for batting in order to pick up the relatively small ball that is travelling at speed and pick an appropriate shot.
- Agility is important for cricket when running between the wickets (changing direction on order to come back for another run)

### A03 – Justifications made with specific reasoned conclusions fully linked and appropriate to cricket

- Without good hand-eye coordination a batsman may find that they miss the ball altogether or perhaps don't find the middle of the bat and struggle to score runs.
- Agility isn't vitally important in cricket as the key skills of batting and bowling don't require fast changes of direction all of the time.
- Coordination is more important than agility due to the constant need to use hand-eye coordinaton as a bowler, fielder and batsman
- Whether agility or coordination are more important for a cricketer is likely to come down to their role as a player and will also depend on specific situations within a match
- A wicket keeper is required to change direction quickly in reaction to the ball moving in the air (swing), off the floor (spin) or coming off the edge of the bat. Without agility they wouldn't be able to produce an effective performance in their role.
- Other components of fitness are just as important in cricket, such as muscular endurance for a bowler and reaction time for a batsman and fielder
- Tiredness will have an effect on coordination in the latter stages of a match. Unless hand-eye coordination is exemplary, a batsman may find he loses his wicket when tired.

Name each of the sportspeople shown below, identify their sport and describe which component of fitness is most important to them. Make sure you use all 10 components of fitness.



Adam Peaty - Flexibility



Joe Root - Coordination



Mo Farah – Cardiovascular Endurance



Tyson Fury – Strength



Marcus Smith - Agility



Jamie Vardy - Speed



Emma Raducanu – Reaction Time



Geraint Thomas – Muscular Endurance



Simone Biles - Balance



Dina Asher-Smith - Power

Strength and reaction time are components of fitness.

Assess the importance of each of these components of fitness to a weight lifter.

i) Strength (2)

Mark One – Strength is the ability to overcome a resistance

Mark Two – This is very important to a weight lifter as the bigger maximal force that they can create, the heavier the weight they can lift

ii) Reaction Time (2)

Mark One – Reaction Time is the time taken to initiate a response to a stimulus

Mark Two – This isn't vitally important to a weight lifter as this event isn't about completing the lift in a certain amount of time or reacting quickly to a stimulus.

**Key Terms:**

**Health** – A state of complete emotional, physical and social well-being and not merely the absence of disease and infirmity

**Fitness** – The ability to meet the demands of the environment

**Cardiovascular Endurance** – The ability of the heart and lungs to supply oxygen to the working muscles.

**Strength** – The ability to overcome a resistance

**Muscular Endurance** – The ability of a muscle or muscle group to undergo repeated contractions avoiding fatigue

**Flexibility** – The range of movement possible at a joint

**Agility** – The ability to move and change direction quickly (at speed) whilst maintaining control

**Balance** – The maintenance of the centre of mass over the base of support

**Co-ordination** – The ability to use different (two or more) parts of the body together smoothly and efficiently

**Power** – The product of strength and speed, i.e. strength x speed

**Reaction Time** – The time taken to initiate a response to a stimulus

**Speed** – The maximum rate at which an individual is able to perform a movement or cover a distance in a period of time. Speed = distance ÷ time