



Component 3A: Explore the importance of fitness for sports performance

Name _____

Class _____



A1: The importance of fitness for successful participation in sport

A2: Fitness training principles

A3: Exercise intensity and how it can be determined

A1: The importance of fitness for successful participation in sport

Many types of sports require specific components of fitness.

Please match the examples of sports with the components of fitness that are required for the sport.

The first component has been completed as an example.

Sports Examples: sprinting, discus throwing, gymnastics, martial arts, basketball, tennis, marathons, cycling, football (goalkeeping), skiing, ice skating

Components of fitness	Used for	Sports requiring the component
Aerobic Endurance	Events/sports lasting more than 30 minutes	
Muscular Endurance	Events/sports lasting more than 30 minutes	
Muscular Strength	Activities requiring force	
Speed	Activities requiring fast movement	
Flexibility	Activities requiring a wide range of movement around a joint	
Body Composition	Low body fat	
Power	Activities requiring explosive movement	
Agility	Activities requiring quick changes of direction	
Reaction Time	Any activity where a quick decision or response to a stimulus is needed	
Balance	An activity requiring control of the distribution of weight or to remain upright and steady	
Coordination	Any activity requiring movement of two or more body parts	

Name 3 components of fitness required for the following sports:

Hockey:

- 1.
- 2.
- 3.

Swimming:

- 1.
- 2.
- 3.



A2: Fitness training principles

You need to be able to understand the principles of training and how they can be applied to training programmes.

There are 4 basic principles of training:

1. **Frequency**
2. **Intensity**
3. **Time**
4. **Type (FITT)**

Match the basic principles of training with their descriptions and then how a weightlifter would incorporate them in their training.

Principle of Training	Description
	The number of training sessions completed over a period of time, usually per week
	How an individual will train by selecting a training method to improve a specific component of fitness.
	How hard an individual will train.
	How long an individual will train.

How would a weightlifter incorporate these basic principles in their training?

Frequency:

Intensity:

Time:

Type:



Additional Principles of Training:

Progressive Overload:

This means gradually increasing the amount of overload during training in order to improve fitness but without injury. In other words, if you increase the intensity of your workouts gradually you will make steady improvements.

Explain how an athlete could use progressive overload to increase their muscular endurance whilst using a bench press. Give an example in your answer.

Explain how an athlete could use progressive overload to increase their muscular strength whilst using a bench press. Give an example in your answer.



Specificity:

This means matching training to the requirements of an activity. Different sports (and different positions within sport) require athletes to excel in different components of fitness.

How would the training programme of a marathon runner and a weightlifter differ?

How would the training programme in football differ for a goalkeeper and a striker?

Individual Differences:

The first thing an athlete must consider when creating an exercise programme is their own individual needs. The needs of an individual could alter due to their fitness level, weight, gender or previous injuries.

Why would it not be a good idea for a first-time marathon runner to follow the training programme of an elite athlete?

Adaptation:

This is about how your body changes due to increased training loads.

Using weightlifting as an example again, describe how a beginner would adapt their training over 2 weeks.

Reversibility:

This means gradually losing fitness and occurs to anybody who stops training.

Give 3 reasons why reversibility might occur to an individual.

- 1.
- 2.
- 3.



Variation:

You can avoid boredom and maintain motivation to train by altering the types of training.

How could a basketball player make their dribbling drill more interesting?

Rest & Recovery:

This is very important during an exercise programme and without rest, progressive overload is unlikely to occur.

Why is it important for a marathon runner to rest following a heavy training session?

A3: Exercise intensity and how it can be determined

Sports performers need to understand exercise intensity and how it can be measured or worked out. They will also understand the target zones and the related technical vocabulary.

Intensity:

You can measure exercise intensity by measuring heart rate (HR). You can do this by feeling your _____ (either at your carotid/wrist) for 30 seconds and multiply it by _____.



Target Zones & Training Thresholds:

Training thresholds are set to make sure that people train at an effective but safe level.

The calculation of your target zones is known as **The Karvonen Formula**.

The Karvonen Formula (simplified):

Firstly work out your maximum heart rate with the formula: **220 – age (in years)**

What is the maximum heart rate for a 15 year old? _____

Your aerobic zone is what percentage of your maximum HR? **60-80%**

Therefore what is your aerobic target zone? _____

Your anaerobic zone is what percentage of your maximum HR? **80-90%**

Therefore what is your anaerobic target zone? _____

Example 1: Emma is 20 and is training for a marathon. Using the karvonen formula (simplified), how would you work out Emma’s aerobic training zone? (3 marks)



Example 2: Tom is 16, has a resting heart rate of 64 bpm and has just completed a six-week personal exercise programme (PEP):

Week 1 – 180

Week 2 – 172

Week 3 – 160

Week 4 – 175

Week 5 – 145

Week 6 - 150

State the total number of weeks Tom’s heart rate was within his aerobic target zone.

(1 mark)

A One

B Two

C Three

D Four

State the total number of weeks Tom’s heart rate was within his anaerobic target zone.

(1)

A One

B Two

C Three

D Four

The Borg Rating of Perceived Exertion Scale:

This rating is a way of measuring physical activity intensity level.

Perceived exertion is how hard you feel like your body is working. It is based on the physical sensations a person experiences during physical activity, including increased heart rate, increased respiration or breathing rate, increased sweating, and muscle fatigue.

6		How you feel when lying in bed or sitting in a chair relaxed. Little or no effort.
7	Very, very light	
8		
9	Very light	
10		Target range: How you should feel with exercise or activity.
11	Fairly light	
12		
13	Somewhat hard	
14		
15	Hard	
16		How you felt with the hardest work you have ever done. Don't work this hard!
17	Very hard	
18		
19	Very, very hard	
20	Maximum exertion	

RPE can be used to estimate heart rate (HR), using the equation:

$$\text{RPE} \times 10 = \text{HR}$$

Example 1: Lucy has completed ballet for 30 minutes and her RPE is 14. Estimate her heart rate.

Example 2: Aidan has a heart rate of 160bpm after completing 2 hours of tennis. What is his RPE?



Repetition Maximums:

1 Rep Max. (RM) = the heaviest amount you can lift in one repetition.

15 Rep Max. (RM) = the heaviest amount you can lift and repeat 15 times.

Match the types of RMs with their relevant component of fitness.

Strength

Muscular Endurance

1 RM is for _____.

15 RM is for _____.

Technology to Measure Exercise Intensity:

To measure exercise intensity, you can use:

1. Heart Rate Monitors
2. Smart Watches
3. Apps

Describe how a runner could use the above technologies to measure the intensity of their running.



Key Terms

Individual Differences – The needs of an individual could alter due to their fitness level, weight, gender or previous injuries.

Specificity – The particular requirements of an activity

Progressive Overload – Gradually increasing the amount of overload to improve fitness but without injury

FITT Principle – Training principle linked to progressive overload, based on frequency, intensity, time and type

Reversibility – Gradually losing fitness instead of progressing

Target Zone – The range within which an individual needs to work

Training Threshold – A safe and effective level to train at

Karvonen Formula – A test to find out an individual's optimum heart rate

Resting Heart Rate – The amount of times your heart beats per minute at rest (normal RHR is 60-80 BPM)

Maximum Heart Rate – Your highest possible heart rate. $220 - \text{Age}$