Additional principles of training 1

You need to be able to define the principles of training and explain how they would be applied in a practical context.

SPECIFICITY means that training should be specific to the individual's sport, activity or fitness-related goals.

The principle of specificity is about matching training to the particular requirements of your activity, making sure that training is relevant to your sport or the fitness goals you are trying to achieve. This is so that you train the appropriate muscles in the right way, rather than working on other aspects of fitness that may not help to improve your performance.

Don't get specificity confused with individual needs – specificity is about the requirements of the activity and not the person.

Specific training for a sprint cyclist could be using an exercise bike in a gym – a better match than a treadmill or a rowing machine.

Applying the specificity principle to training

You need to think about the fitness requirements of your sport to decide on the most appropriate specific training. For example:

- it would be appropriate for a 100 m sprinter to do speed training on a track or to work on sprint starts because these activities are directly relevant to a sprinting event
- it wouldn't be appropriate for a discus thrower to do speed training on a track as this activity is not relevant to their sport
- specific training for a swimmer would be more likely to be based in a swimming pool, to work muscles in the same way as in swimming events
- specific training for a football player could involve fartlek training in a local park.

Worked example

Josh is a middle-distance runner. His coach has suggested that he should do some training at his local swimming pool.

Using the principle of specificity, explain if this is appropriate training. **(2 marks)**

The training is not appropriate because Josh is a runner, therefore if he swims he will be training the wrong muscles and will not be improving his fitness for running so will not improve his performance.

Now try this

Look at the images on the right, which show three different pieces of fitness equipment.

For each piece of equipment, state **one** sporting activity for which it would be an appropriate method of training. **(3 marks)**

Think about what each piece of equipment specifically exercises and then think about who that would be useful to.

Fitness equipment	Appropriate sporting activity
 Rowing machine	
 Exercise bike	
 Treadmill	

Additional principles of training 2

Training needs to be demanding enough to cause the body to adapt. In order to make fitness gains, training must get more demanding over time – this is called PROGRESSIVE OVERLOAD.

It is important that overload is applied gradually to reduce the risk of injury.

Progressive overload can be applied by using the FITT principles and gradually increasing the:

- FREQUENCY of training
- INTENSITY of training
- length (TIME) of training.

Someone training for a half marathon could apply this principle to their training by gradually:

- ✓ running further, or
- ✓ running for longer, or
- ✓ running at a slightly faster pace, or
- ✓ running more often.

It is important not to use all these methods at once, as the increase in workload could lead to overtraining.

It is important to overload but not to overtrain. Overtraining can result in injury or illness.

Increasing intensity

In a fitness training programme, progressive overload can be applied by increasing the intensity of training. It might look like this:

Week 1 = do 10 pull-ups
Week 2 = do 15 pull-ups
Week 3 = do 20 pull-ups

The plateau

If an athlete trains regularly but at the same intensity for a prolonged period of time, their body will become used to the load being placed on it. This is known as the TRAINING PLATEAU.

Worked example

What is the difference between overload and overtraining? **(2 marks)**

Insert the correct term next to each definition.

Overload is the process of making your body work harder than it is used to in order to improve specific aspects of fitness.

Overtraining is pushing yourself beyond your capabilities and is more likely to result in an injury.

Make sure you learn the difference between these terms.

Now try this

Using a sporting example, explain the principle of progressive overload. **(2 marks)**

Think about overload over time – how would you apply the FITT principle to this question?

Always make sure you use relevant examples.

UNIT 1
Learning aim A

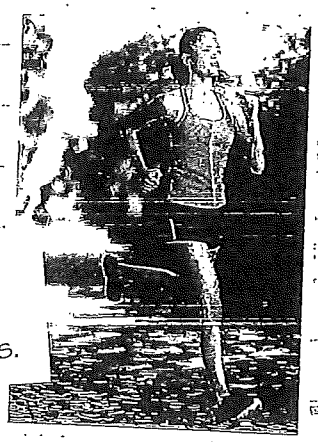
Had a look ☐ Nearly there ☐ Nailed it! ☐

Additional principles of training 3

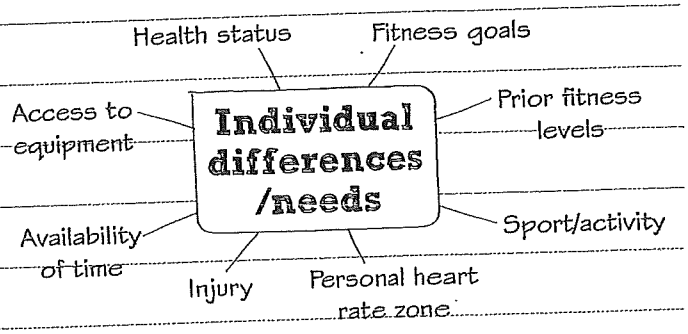
All fitness training programmes should be designed to meet the training needs and goals of the INDIVIDUAL. Programmes should be designed specifically for the individual, taking into account differences.

Individual differences/needs

If one person wants to improve their speed and agility while another wants to improve their aerobic endurance, their training needs would be very different.



Every athlete has individual training needs.



This is all about the individual needs of the performer – you must ensure that the training programme chosen will help them to meet their individual fitness goals.

Lifestyle factors

Certain lifestyle factors such as working hours, cost and access to specialised facilities may impact on an individual's training needs.

If someone is working during the day they would need to have access to training early in the morning or in the evening. This would be an individual need.

Worked example

Anna is a netball player and wants to develop explosive power in her quadriceps to help increase her jumping height.

Why would a speed training programme **not** be appropriate? **(2 marks)**

Training needs to be tailored to meet the individual needs of the performer. Speed training, although appropriate to netball, would not help Anna meet her specific training goal as well as a training programme such as plyometric training that included jumps.

Individual vs. specific

INDIVIDUAL training needs are not the same as SPECIFIC training needs. Individual training needs are about the person; specific training needs are about the activity or sport.

Now try this

(a) State **two** lifestyle factors that may impact on a person's access to exercise. **(2 marks)**

Think about what would affect your own exercise routine.

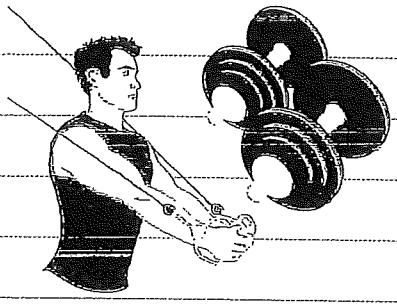
(b) Outline the potential impact of these factors on an individual's training needs. **(2 marks)**

Additional principles of training 4

Your body will respond to training by ADAPTING and improving its ability to cope with increased training loads, but this process can also be REVERSED if training stops.

Adaptation

Adaptation happens during the recovery period following a training session. It is the way your body increases its ability to cope with training loads.



Weight training causes the body to adapt muscle size and increase strength.

Reversibility

Just as fitness can be improved with regular training, it can also be lost if training is stopped, for example as a result of injury or if the INTENSITY of the training is not sufficient to cause adaptation. Reversibility is also known as de-training.

Muscular adaptations

MUSCULAR HYPERTROPHY is an example of an adaptation related to weight training. Over time, training results in an increase in the number and size of muscular cells called myofibrils. This increases the size of the muscle and results in an increase in strength.

A loss in muscular size and strength is called MUSCULAR ATROPHY.

Rest and recovery

Rest is the period of time provided for recovery to take place. It is important to allow enough time to recover as this is when training adaptations occur. Recovery also allows damage to be repaired and energy stores to be replenished.

By not allowing for rest and recovery you run the risk of overtraining. This can cause a drop in performance due to insufficient time for rest and recovery and increases the risk of injury.

Worked example

Which of these is **not** a reason for rest and recovery in training? **(1 mark)**

A ☐ Positive training adaptations
B ☑ Reduce blood pressure
C ☐ Repair damage
D ☐ Replenish energy

Now try this

Explain the difference between adaptation and reversibility. **(2 marks)**

For 'explain' questions you should write a few sentences. Identify the main difference and then expand your answer.

Additional principles of training 5

It is important to add VARIATION to training routines to avoid boredom and maintain enjoyment.

Varying training routines

Minor changes in routine can produce large fitness gains. This change is known as variation.

Some basic things that could be done to ensure variation include changing the:

- type of equipment
- training environment
- order of training
- type of exercise
- nature of your training.

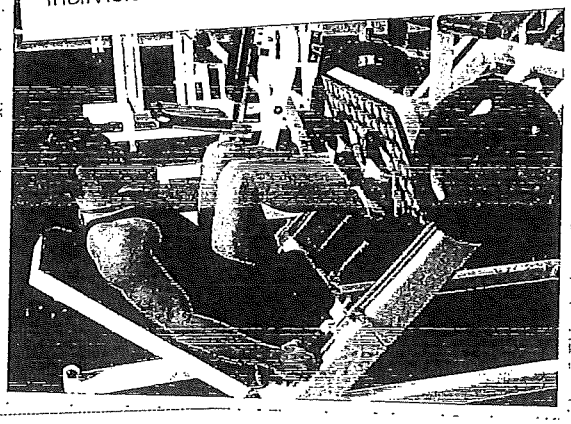
Why is variation important?

Variation is important because it helps to:

- ✓ keep you interested and maintain the motivation and enjoyment associated with training. If you are doing the same training all the time you are likely to become bored and so more likely to give up.
- ✓ provide new challenges for your body and reduces the risk of injuries caused by the repetition of the same actions and training methods.

Variation in practice

You still need to consider the specificity principle (see page 16) so that any variation is beneficial to the individual and their training goals.



An example of variation in practice is a footballer who uses both bounding ladder drills and weigh training to help build both leg power and strength. This will allow for recovery and adaptation to take place whilst maintaining enjoyment. This way he is more likely to persist with his training.

Worked example

Think about all the different training programmes before you answer this question.

Neelesh is training on his own to improve his aerobic endurance.

Give **two** examples of how variation can be applied to reduce boredom in his training. **(2 marks)**

Neelesh could change his training location for one session a week. Instead of running on the road he could run on a treadmill in the gym. He could also try running as part of a group rather than on his own.

Now try this

Give **two** reasons why variation in training is important. **(2 marks)**

Think about how you would feel if yo did the same training all the time.

Had a look ☐ Nearly there ☐ Nailed it! ☐

UNIT 1
Learning aim B

Circuit training

A sports performer's training routine can include lots of different training methods. Circuit training involves a series of different activities that can be either sport-specific or tailored to improve certain aspects of fitness. Circuit training can be adapted to suit the fitness needs of the individual. It can also be used to improve general fitness.

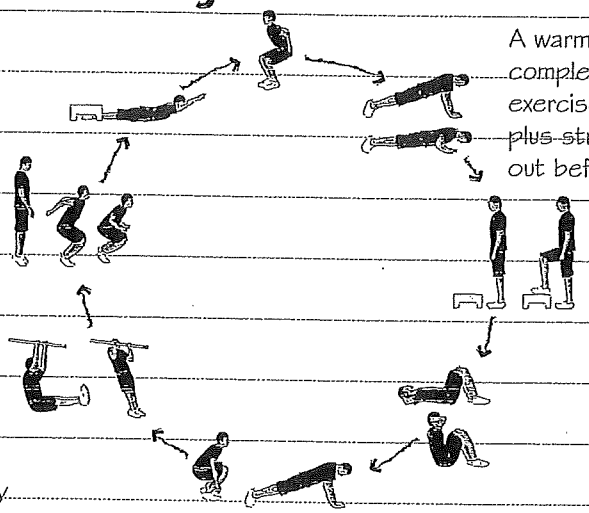
Features of circuit training

Multiple stations

Can be used to develop all aspects of fitness – depending on the stations chosen

Can be fitness-based or sport specific

Can be either aerobic or anaerobic depending on intensity



A warm-up should always be completed. Some cardiovascular exercises, such as light jogging, plus stretching, should be carried out before circuit training.

Activities are done for 30–60 seconds

30–60 seconds is allowed for moving between stations

Increasing intensity

Intensity can be increased by:

- increasing the time at each station
- increasing the number of circuits completed
- adding extra stations.

Advantage: can be adapted to suit any fitness level or any type of sport.

Disadvantage: often requires lots of space and specialised equipment.

Variation

The exercises at circuit stations should be varied so that muscles have time to recover. To reduce the risk of injury you should never exercise the same body part or muscles consecutively.

Worked example

Ghalib wants to improve his upper-body muscular endurance.

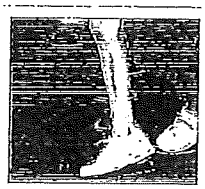
Give **three** examples of stations that would be appropriate for him to include in a circuit. **(3 marks)**

Sit-ups, tricep dips, back raises.

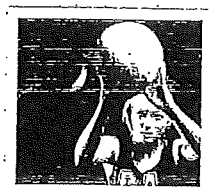
Remember the **principle of specificity** when answering this question. Which stations will help Emma improve her performance at netball?

Now try this

Emma is 15 years old. She has designed a circuit to help improve her performance in netball. The images below show each of the four stations:



Station 1 – running in and out of cones



Station 2 – shots into a netball ring

Station 3 – bowling at a target

Station 4 – chest passes at a wall

Circle the station that isn't appropriate for her circuit. **(1 mark)**