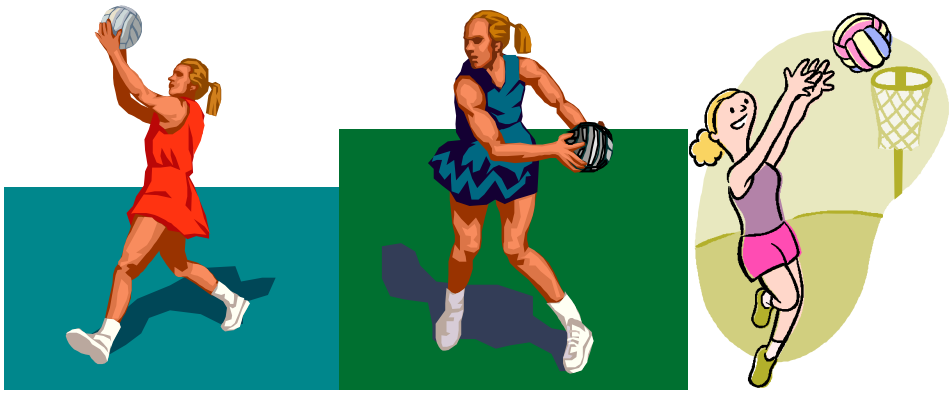
GCSE Physical Education Coursework

Training Programme Project



By Lucy Cable

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Planning - Introduction

Task: Design a training programme for your chosen sport, focusing on improving one or more types of fitness.

My main aim is to complete a training programme, focusing on mainly developing the use of stamina in Netball.
In order to achieve my main aim, I will firstly have to test my prior fitness to plan a suitable training programme for my level of fitness and one which will allow me to improve my current level of fitness, ultimately resulting in a better performance in my chosen sport, Netball.

Secondly, I will explain some of the theoretical aspects of physical education and also investigate and explain how preparation, training and fitness relate to and affect performance in sport.

Thirdly, with a greater knowledge of the above, I will be able to design a training programme for my chosen sport, in relation to stamina. Some of the theoretical aspects, learnt in class, which I shall apply to my training programme are:

- The planning of my fitness programme
- The appropriateness of my chosen activities or training methods for developing stamina in Netball.
- The suitability of the programme in terms of age, sex and fitness levels taking into account injuries or medical conditions.
- The four principles of training: specificity, progression, overload and reversibility.
- The safety precautions needed to be taken whilst participating in the programme – lifting, carrying and the placement of equipment/apparatus.
- The preparation prior to activities and the recovery after exercising: warm-up and warm-down.
- Simple fitness tests – to assess fitness, i.e. the shuttle run test and the sit and reach test.

In addition, I will relate the importance of exercise to personal, social and mental health and well-being, an area already studied in class. I also aim to discover how to monitor and develop my training programme, which will be made possible after carrying the programme out a few times and analysing it. This will hopefully enable me to improve the training programme further and therefore, in turn, improve performance in my chosen sport, Netball.

Finally, I aim to develop my leadership skills through the process of preparing and leading warm-up/warm-down session.
If I am able to complete the above, I will have successfully achieved my main aim of the project.

Testing of Prior Fitness

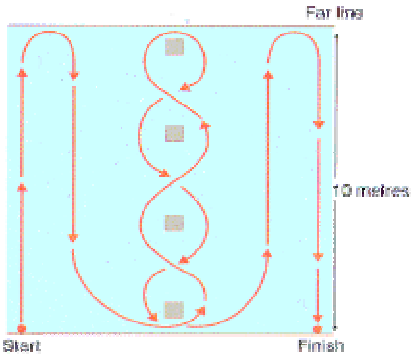
For my training programme to be at the right level in terms of complicity, intensity and suitability, I need to test my prior levels of fitness. I have chosen to do this by carrying out a series of fitness tests, recording my scores and deciding upon achievable targets. Firstly, some facts about me:

NAME: Lucy Cable
AGE: 15
HEIGHT: 5ft 3in
WEIGHT: 7st 4lbs
RESTING PULSE RATE: 100

Information about my current level of fitness

- I walk to and from school most days. It takes me about 15 minutes each way.
- I dance 4 times a week. Classes Monday-Saturday are on average 1 hour duration and on Sunday I have an intensive 2 and a quarter hour class at the Birmingham Royal Ballet. My classes during the rest of the week are on Monday (Modern Dancing), Thursday and Saturday (Ballet).
- I attend badminton club after school every Friday, exercising for 1 hour.

The tests which I will carry out to assess my current fitness levels are explained below, along with my results:

Type of Fitness	Name and Description of Test	My Result
Co-ordination	**Alternate Hand wall toss test** → Stand 2 meters away from a smooth wall → Throw a tennis ball with your right-hand against the wall and catch with your left-hand → Repeat using alternate hands for 30 seconds.	17
Agility	**Illinois Agility Run** → Being by setting up the course as shown in the below diagram. → Lie face down on the floor at the starting line. → When told to start leap to your feet and complete the course in the shortest time possible. 	20 seconds

Balance	**The Stork Stand** → Stand comfortably on both feet and place your hands on your hips. → Lift one leg and place the toes against the knee of the other leg. → On command raise your heel and stand on your toes, balancing for as long as possible without letting either the heel touch the floor or the other foot move away from the knee. Time your balance in seconds.	23 seconds
Muscular Power	**Standing Vertical Jump** → Stand next to a wall and reach up with whichever arm is nearest to the wall. → Mark the highest point you can reach with your fingers – both feet must remain flat on the floor. → Now chalk your fingers and perform a vertical jump, marking the wall at the highest point you can reach. → The distance between the two marks gives you a measure of how high you can leap from the ground and from a stationary start. *It takes into account your height and so is a fairer test than the standing broad jump.	30
Muscular Endurance	**The NCF abdominal Curl Test** → Complete as many sit-ups as possible in 30 seconds. → Come up 90^{o} from your back. → Arms remain on chest.	27
Flexibility	**Sit and Reach Test** The measures for the flexibility of the hamstrings. → Sit on the floor, legs straight, feet flat against the table with shoes removed, and fingertips on the edge of the top plate. → Bend your trunk and reach forward slowly and as far as possible, keeping the knees straight. Hold this for 2 seconds. → Measure the distance from the edge of the table to the position reached by the fingertips. Be sure you make a number of warm-ups attempts before the actual measurement is taken.	32

As well as the above fitness tests, I have also completed a 12 minute cooper run test for which I achieved a score of 1,850m (4 times round the 400m track plus an extra 250m). The aim of the cooper run is to run as far as you can in 12 minutes around a marked area. This is a test for muscular endurance.

Comparing my scores and setting achievable targets

Unless I can compare my results to national averages, there is no point in completing fitness tests as there would be nothing to aspire to. Unfortunately, I can compare my results to national averages so that I can set reasonable targets to achieve by the end of my training programme. I have made comparisons and suggested targets which I believe are achievable below. I have also stated whether I will be improving the particular type of fitness in my training programme in order to improve performance in my chosen sport, Netball. First, here is the comparative table of national results and my results.

Fitness Test	My result	Comparative scores – for females 15-16 years	
Alternate hand wall toss test – co-ordination	17	High Score	More than 30
		Above Average	25-30
		Average	20-24
		Below Average	15-19
		Low Score	10-14
Illinois agility run	20	High Score	Faster than 17.5
		Above Average	17.5-18.6
		Average	18.7-22.3
		Below Average	22.4-23.4
		Low Score	Slower than 23.4
The stork stand – balance	23	High Score	Above 49s
		Above Average	40-49s
		Average	26-39s
		Below Average	11-25s
		Low Score	Below 10s
Standing vertical jump-muscular power	42	High Score	Above 60
		Above Average	60-51
		Average	50-41
		Below Average	40-35
		Low Score	Less than 35
The NCF Abdominal Curl Test – muscular endurance	27	High Score	35+
		Above Average	30-35
		Average	25-30
		Below Average	20-25
		Low Score	Below 20
Sit and Reach Test – flexibility	32	High Score	Above 35 cm
		Above Average	32-35 cm
		Average	30-31cm
		Below Average	25-29 cm
		Low Score	Less than 25 cm

Explanation of my results

From the above national averages, I can say that in general most of my results are average, i.e. illinois agility run, standing vertical jump (muscular power). Some are slightly below and slightly above, i.e. stork stand (balance) is 2 seconds off average, on the other hand, sit and reach test (flexibility) is a mark above average. This shows that, currently, I have reasonable levels of fitness, but completing a suitable training programme would be beneficial for improving performance in Netball.

Appropriateness of exercises (specificity)

Netball is a team game which generally requires all players to be agile (change direction quickly at pace) as well as keeping up this pace throughout a game, have good co-ordination (for catching and throwing the ball) and good thinking skills for a game situation. So, in order to improve these three skills I will include activities based on improving agility, stamina (muscular endurance), speed, strength, co-ordination and (if possible) particular skills related to Netball in my training programme. As already mentioned, I will be focusing more directly on developing muscular endurance (or stamina); hence more of my activities will be related to this type of fitness. Also, I must consider the order of my activities within the training programme, to avoid working the same muscles consistently for long periods of time and risks of injuries.

Setting achievable targets

With knowledge of my fitness levels prior to beginning the training programme, I can now set achievable targets...

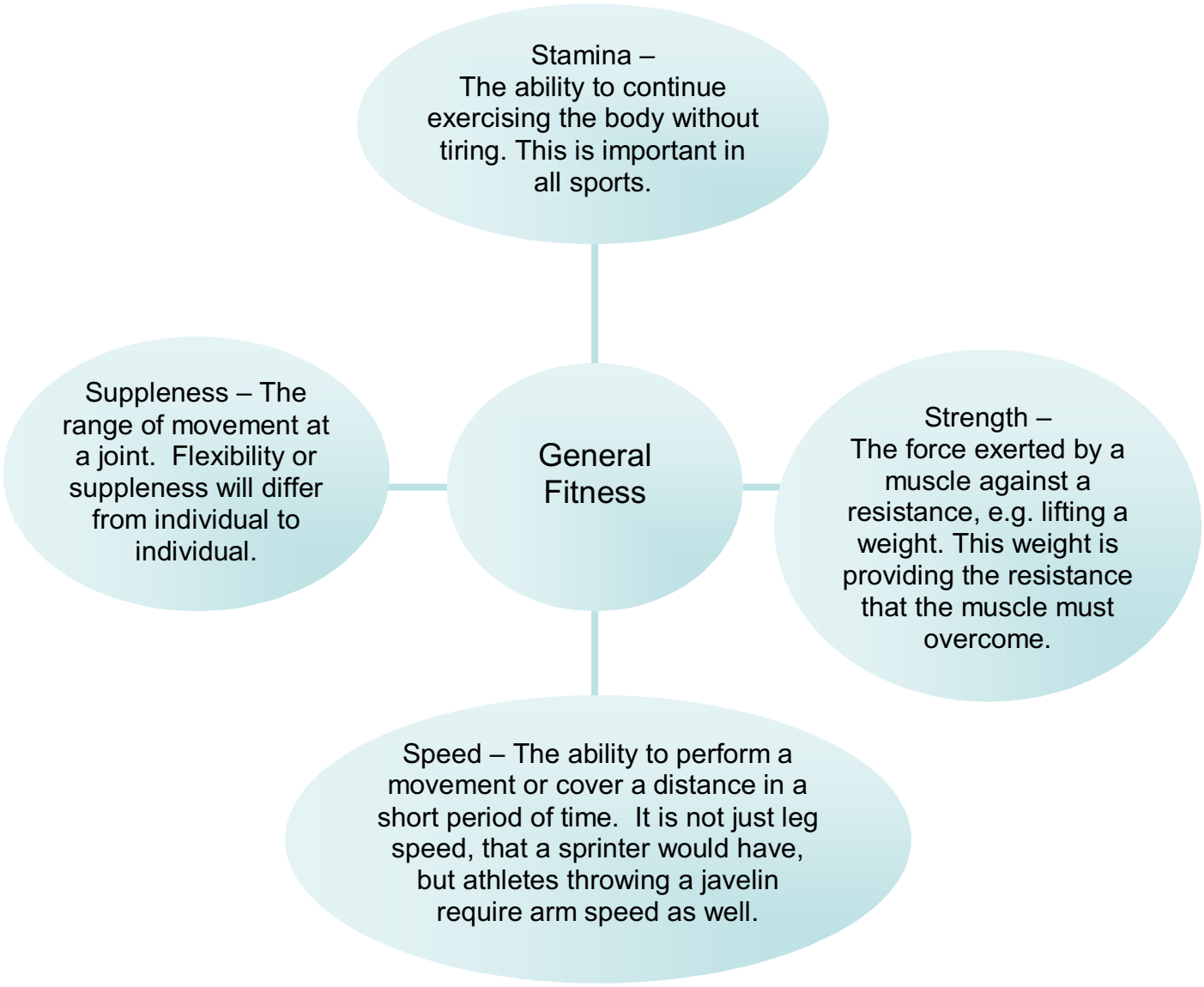
1. I hope to complete 5 sessions of the training programme
2. In each session, I will complete 10 activities correctly and record my results each session for analysis and evaluation later.
3. Each of the 10 activities will be performed for 30 seconds and which a rest period of 30 seconds will follow.
4. If I am finding the activities too easy, the intensity, frequency or duration will be increased (overload), as well as if I am finding the activity too hard these factors will be decreased.
5. By the end of the 5 sessions I should see a valid improvement in my fitness test scores from my pre-test scores.

Physical Education theoretical aspects

In order to plan a successful training programme, for my chosen sport, netball and focus on stamina, the theories need to be understood. These theories have been learnt in class and will aid my preparation, performance and evaluation of the training programme.

What is fitness?

One definition of fitness is that it is a variety of factors which combine to give a sportsperson an efficient body, able to cope with a high degree of physically demanding activity. Fitness can be classified into four types of general fitness, which are shown and given a short definition for in the diagram below:



Specific Fitness

As well as the components of general fitness, which are usually necessary to achieve in all sports, there are components of specific fitness, which are normally related to a particular sport. These are listed below, along with sporting examples that they relate to:

1. Agility – A combination of speed and flexibility, e.g. performing a floor routine in gymnastics.
2. Co-ordination – The ability to properly control your body when performing a physical action, e.g. high jump in athletics.
3. Balance – The ability to retain equilibrium whether static or dynamic, e.g. a high kick in jazz dance.
4. Power – The combination of the maximum amount of speed with the maximum amount of strength, e.g. performing a long jump in athletics.
5. Reaction Time – The ability to react to a stimulus quickly, e.g. the goalkeeper's job in football.

The Principles of Training

The reason for training is to improve your ability to take part in physical activity. There are four guiding principles which apply to all fitness training. They are:

- → Specificity - Training must be specific to the sport or activity, the type of fitness required and the particular muscle groups. E.g. Marathon runners do mostly endurance work whereas swimmers exercise 'swim specific' muscles.
- → Overload - Training must be raised to a higher level than normal to create extra demands to which the body will adapt. This can be done in three ways:
    - INCREASE THE INTENSITY – by running faster, lifting heavier weights, etc.
    - INCREASE THE FREQUENCY – by training more often, 3 or 4 times a week.
    - INCREASE THE DURATION – by training longer to prolong demands.
- → Progression - As the body adapts to training it progresses to a new level of fitness. Progress to the next level is achieved by gradual increase in intensity to create an overload. As time of exercising increased so would the level of fitness. Also, most progress would be made in the early stages and as the levels of fitness get higher there would be less progress.

PROGRESSION to a higher level of fitness is difficult to achieve.

- → Reversibility - Training effects are reversible. If exercise is reduced in intensity or stopped altogether then the benefit can be quickly lost. Deterioration sets in after about one week. Strength and speed are gradually lost with muscles losing their tone and size i.e. atrophy.

The above will all be helpful to me when planning my training programme and will all have to be taken into consideration.

The F.I.T.T. Principle

When I come to planning my training programme and deciding upon activities to include, in order to develop stamina in netball, the FITT principle will be useful to me. Also, when coming to assess the training programme the FITT principle could be something I would change to improve the programme. The four letters in the FITT principle stand for the following:

F = Frequency – how often do you train

I = Intensity – how hard do you train

T = Type – what activities do you include in your programme

T = Time – how long do you train/rest

Training Methods

Another consideration for the training programme will be the training method (s) which I will use. This will have to be carefully chosen to benefit the programme as much as possible. The five training methods that I have to choose from are:

Weight Training

Weight training involves a series of exercises where each one focuses on a specific muscle group in the body. All of these exercises involve the overcoming of a resistance or load by the use of a machine or free weights.

Repetitions and Sets

These depend on whether a person is attempting to build up STRENGTH or ENDURANCE. Typical programmes could be:

10 reps
3 sets
large load … for STRENGTH

20 reps
3 sets
small load … for ENDURANCE

Effect of weight training on the body

It improves muscular strength, endurance, tone and posture.
It increases muscular size, bone density and your metabolic rat

Circuit Training

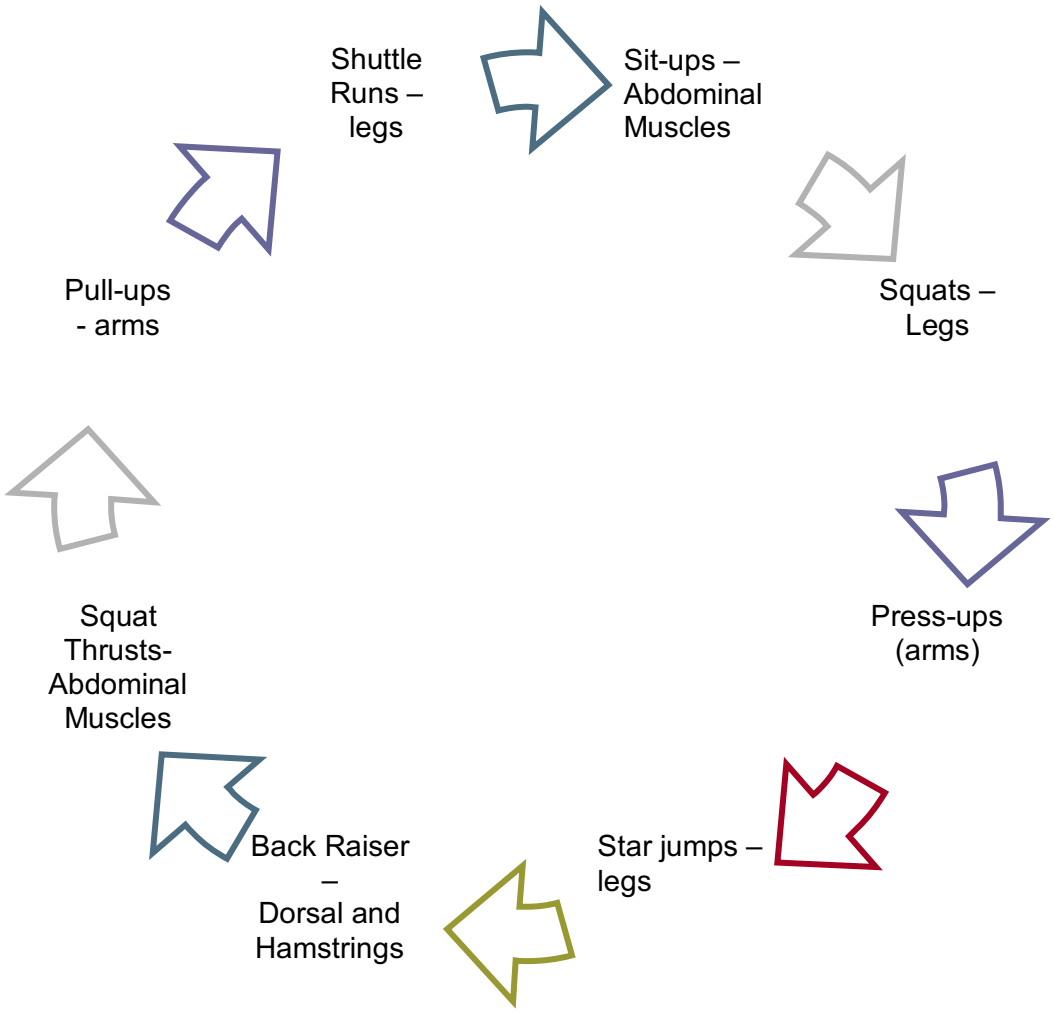
Circuit training involves a series of exercises or activities, with each one taking place at a different station. Each station involves an exercise aimed at a specific muscle group in the body. The exercises are arranged so that…

- … muscle groups alternate between work and recovery, to allow lactic acid dispersal.
- … opposing muscle groups are worked for balanced strength distribution.

Circuits can be designed to improve:

a) Fitness (aerobic and anaerobic)
b) Strength and Endurance
c) Sport specific actions
d) General muscle tone
e) Personal targets

Here is one example of a set of exercises which could be used in a circuit:



Repetitions and Sets
Circuits can be organised on the basis of time or repetition and may include rest intervals, or alternatively they could be non-stop. A typical programme could be: THREE CIRCUITS. ONE SET OF TEN REPS AT EACH STATION – NON-STOP!

Effect of circuit training on the body
It Improves: GENERAL MUSCULAR STRENGTH, ENDURANCE, MUSCLE TONE, and POSTURE.
It increases: BONE DENSITY, METABOLIC RATE&decreases BODY FAT %.

Interval Training

Interval training involves ALTERNATING between FIXED PERIODS OF EXERCISE and FIXED PERIODS OF REST (or light exercise). Careful planning is needed to match the duration and intensity of exercise and recovery with the level of fitness of the individual.

E.g.
25m Sprint, 30 sec rest, 25m sprint, 30 sec rest, etc, etc…

Interval training is effective for most team sports and is an APPROPRIATE method of training for running an swimming.

Fartlek Training

Fartlek training is very similar to interval training, except that he intensity and type of exercise are varied through changes in pace, terrain and style. There are no fixed amounts of each component and a programme can be planned to suit the level of fitness of an individual.

e.g.
10 min jog, 100m walk, 50 sprint, 2 min rest, 5 min jog, etc, etc…

Fartlek training is effective for many sports including running, cycling and swimming.

Effect of INTERVAL and FARTLEK TRAINING on the body
Both have similar effects which depend on the intensity and variation of exercise, but generally…
They improve AEROBIC AND ANAEROBIC FITNESS
They increase METABOLIC RATE
They decrease BODY FAT %

Continuous Training

Continuous training involves LONG, SLOW, DISTANCE EXERCISE (LSD) at a constant rate without rest. Training at first should be at 60% maximum heart rate progressing to 85% maximum heart rate as fitness improves and the distance involved increases to beyond competition distance.

Effect of Continuous Training on the body

It improves AEROBIC FITNESS.
It increases METABOLIC RATE and decreases BODY FAT %.

The effect of preparation, training and fitness on performance in sport

All preparation, training and fitness relate to and affect performance in any type of sport. In general, the more regular exercise you do, the greater your level of fitness/health and hence, in most cases, the better your performance. There are many reasons for a long-term increase in fitness when you exercise regularly. Firstly, all working muscles in the body become stronger and larger, this is including the heart, which becomes more efficient (as a result of exercise) and can pump more blood around the body with each beat, as well as sustaining its maximum level with less strain. The heart does this by:

- During exercise the heart rate increases rapidly.
- This provides the muscles with the necessary oxygen and nutrients to provide the muscles with energy.
- During exercise, cardiac output is increased.
- Cardiac output = stroke volume x heart rate.
- During exercise stroke volume increases because:

- more blood is sent back to the heart due to the muscles squeezing blood in the veins.
- as the heart fills up, it stretches.
- as the muscle fibres stretch, they contract more strongly, pumping out more blood.

The resting heart rate of those who exercise is also slower because less effort is needed to pump blood. People who exercise the most often and vigorously have the lowest risk for heart disease, but any exercise is beneficial. Studies consistently find that light to moderate exercise is even beneficial in people with existing heart disease.

Exercise is critical for strong muscles and bones. Muscle strength declines as people age, but studies report that when people exercise they are stronger and leaner than others in their age group.

Secondly, during exercise, the body needs a supply of oxygen to release energy to the muscles. Respiration increases to provide that level of oxygen and remove carbon dioxide.
This is done by:

- Increasing the breathing rate to 3 times the normal rate.
- Increasing tidal volume (the amount of air taken in and out with each breath) by 5 times the normal rate.
- Increasing blood supply to and through the lungs.
- Increasing oxygen up take.

In the long term, this can have a positive affect on the body:

- The body becomes more efficient at using oxygen.

This is known as VO2 max and is a significant indicator of an athlete's fitness. VO2 max can be accurately tested.

As well as improving the general health and well-being of the body, exercise also provides mental and social contributions to a person's life, which can make them feel more confident to continue exercising and enjoying a more healthy and happy lifestyle.

However, exercising at the same intensity all the time will not allow you to increase your level of fitness and your performance. So, to improve you must increase both the amount of training (e.g. exercise for longer or more times a week) and the intensity of training (e.g. increasing the resistance – adding more weights). Nevertheless, the amount and intensity of training have to be controlled, in order to avoid health problems, i.e. injuries.
Injuries can also be prevented by warming-up before participating in any exercise or sport. This is necessary so that:

- The heart rate and blood flow gradually increase which prepares the body for physical activity.
- The muscles warm-up, to allow more flexibility and so they are less likely to tear and cause an injury.
- The joints loosen to allow more mobility at the joint and avoid the likelihood of damaging a joint.
- The individual can mentally prepare for the performance ahead.

A good warm-up includes steady jogging for 10 minutes, stretching for 10 minutes (each stretch held for 10 seconds, ensuring you stretch the relevant muscle groups) and lastly a mental preparation – to become totally focused and in the right state of mind (also ensure to maintain light jogging and gentle stretching between practising specific activities: i.e. sprint starts, passing, receiving, changes of direction).

Just as important as a warm-up, is the warm-down, after participating in sport. This is necessary because:

- It returns the heart rate and respiration rate gently back to normal.
- It allows lactic acid and waste products to be removed from your muscles.
- It helps to prevent muscle soreness and aids recovery.

A good warm-down includes light jogging and gentle stretching of the main muscle groups that you have used.

My specific sport

I am specifically designing a training programme for Netball. So, I will now explain the affect of preparation, training and fitness on performance in Netball.

As previously stated, before beginning any sporting activity it is a good idea to take your body through a warm-up. For netball, an appropriate start to a warm-up could consist of a steady jog for 5 minutes followed by jogging for 5 seconds and sprinting for 5 seconds repeatedly for a further 5 minutes, with rests of 20 seconds (for example). Even the warm-up prior to a game could contribute to performance not just by warming-up the muscles and loosing joints but by using the one type of strength often used in a game situation. This is stamina – the 5 seconds sprint requires speed of movement and maximum muscular effort. Sprinting is used repeatedly throughout netball games.

Next, in the warm-up routine is stretching lasting for 10 minutes. In a game of netball, the leg muscles are used a lot for sprinting, obscuring another player (defending) by riding on tiptoe and bending and stretching when shooting, so I would begin by stretching the GASTROCNEMIUS (each for 10 secs) followed by the QUADRICEPS (each for 10 secs) followed by the HAMSTRINGS (10 secs). The arms are also used a lot for snatching, passing and shooting the ball, so I would continue the 10 minute stretch by stretching the TRICEPS, BICEPS, DELTOIDS (each for 10 secs) and finish by twisting at the waist from one side to another in order to warm – up the side muscles for game play.

The warm-up would conclude with a mental preparation for the games ahead. This would consist of group exercises practising passing and receiving the ball whilst running and sprinting to change direction. Just before the start of the game I would include some time to think about what needs to be achieved in the game itself, by focusing only on the game ahead.

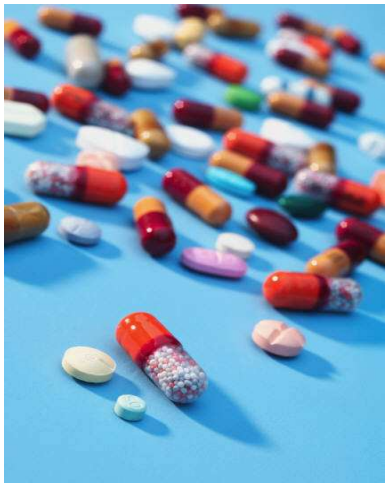
Hopefully, with the warming-up preparation before the game, performance should be at its best, but to also increase performance potential, netball players would need to train more than once a week, building up their training to become stronger and stronger.

Another factor which would need to be considered and monitored in order to achieve a good, constant performance is diet. It is important that you have enough energy to perform to your best in any sport, netball included. This energy is received in the form of the 7 components of a healthy, balanced diet: PROTEINS, CARBOHYDRATES, FATS, VITAMINS, MINERALS, FIBRE AND WATER. The correct proportions of each of these components are as follows:
CARBOHYDRATE – 55-60%
FAT - 25-30%
PROTEIN – 15-20%
VITAMINS AND MINERALS – tiny amounts
WATER – lots (especially when exercising)

Although athletes will stick to the general rules for a healthy diet, some may choose to alter the ratio of carbohydrates, proteins and fat depending on their event.

Planning my training programme – purpose, aims and safety aspects

To begin with, the purpose of the programme is to increase levels of fitness, using appropriate methods, which will enhance performance in the sport netball. To define, in greater detail, the programme will focus on the use of stamina in netball and aim to develop this type off fitness further. By doing so, the programme should benefit overall performance in my chosen sport, netball.



However, whilst planning activities to be included within my training programme, possible injuries or health problems also need to be considered. I need to ensure that the activities decided upon are challenging but not over-strenuous, so that injuries are less likely to occur. Also, in order for the training programme to be fair and safe for participants, the use of performance enhancing drugs must be forbidden, even though it is definitely not probable that they would be exploited because the training programme would not be at such a high level that the use of performance enhancing drugs would be necessary. Participants would also be forbidden to take other drugs such as stimulants to aid their performance, as they can have dangerous side effects.

Safety aspects of the training programme would also need to be carefully considered. Firstly, all equipment and apparatus used in the activities would have to be lifted, carried and placed suitably. For example, wooden benches would have to be carried by 2 people (one at each end) and placed in a safe area of the sports hall, i.e. away from where other activities are commencing. When using heavy objects such as weights, gym mats should be placed underneath and again away from other activities as the weight could be dropped and roll to somewhere else, causing someone to trip over it and injure themselves. Also, the packing away of equipment shouldn't be rushed as moving objects (some heavy) at pace is a potential hazard. Some basic safety factors which would apply to my training programme are:

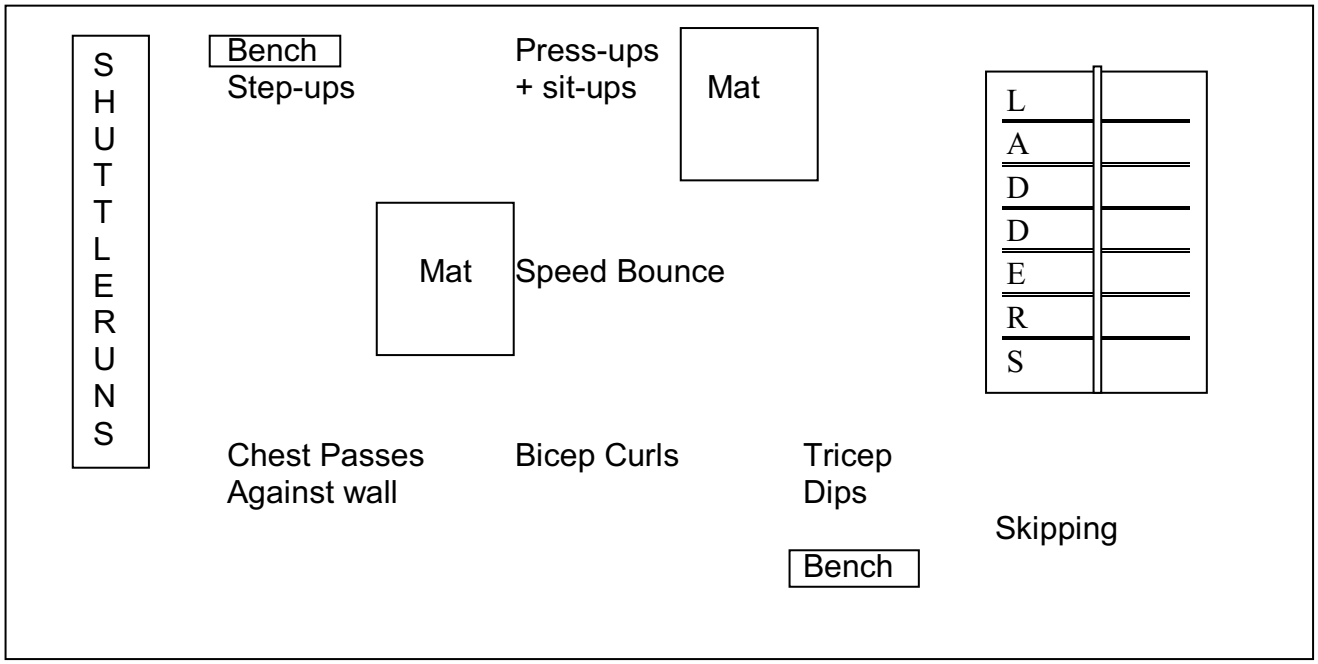
- Lift correctly – when lifting heavy or awkward objects always keep your back straight and bend your legs.
- Wear the correct clothing/footwear for the activity – polo shirt, shorts or tracksuit bottoms, socks and trainers (tied correctly).
- do not wear jewellery
- abide by the rules of the activity
- check any of the equipment which is necessary and use it properly
- make sure the activity is properly supervised
- warm-up before taking part and cool down when finished

The sequence of activities in the training programme

I will now list the sequence of activities (which my group and I will carry out for each of the 5 sessions) within the training programme for developing stamina in a game of netball.

Activity	Fitness it is improving
1. Shuttle Run	Speed/agility
2. Step-ups on a bench	Stamina (muscular endurance)
3. Press-ups (ladies) – as fitness levels increases I will hopefully progress onto full press-ups (overload)	Stamina (muscular endurance)
4. Ladders	Agility/speed
5. Skipping	Co-ordination/stamina
6. Sit-ups	Stamina (muscular endurance)
7. Triceps dips	Strength
8. Biceps Curls	Strength
9. Speed Bounce	Stamina
10. Chest Passes against a wall	Skill-related – to improve hand and eye co-ordination

I will be using a circuit for my training programme, as it is an effective method of training and flexible in terms of the whole class exercising at the same time, i.e. same stations can be set up but groups of 3-4 students will alternate round in a workable fashion. A circuit is normally set up inside a building, which is the case for mine, and so the season/weather is independent to whether the training session will go ahead or not. It will not only improve stamina for Netball (because of related activities) but it will also improve aerobic and anaerobic levels of fitness which will also compliment performance in Netball. Here is a diagram of the layout for my training programme:



Explanation of each activity in the Circuit

1. **Shuttle Run** – The performer sprints to and from a 9m length as many times as possible in 30 seconds. From the starting point to the end is counted as 1 run. As already mentioned, the shuttle run is aimed to improve stamina and speed and uses explosive strength.
2. **Step-ups** – The performer steps up and down onto and off a bench, one foot at a time (repeatedly) for 30 seconds. As already mentioned, this improves stamina and dynamic muscular strength. This activity will work the quadriceps muscles when performed properly.
3. **Press-ups** – For lady's press-ups (what I have chosen to do), the performer starts in the press-up position, but with knees bent to bring the lower led and feet off the ground and completes as many press-ups as possible in 30 seconds. It must be ensured that the whole body is moved down and up, using the biceps and triceps. This particular activity uses and improves dynamic strength.
4. **Ladders** – The performer starts at the beginning of the ladder section and must place both feet between each ladder before progressing onto the next one. As already mentioned, ladders improve a performer's agility.
5. **Skipping** – The performer must complete as many skips as possible in the 30 second time limit. As already mentioned, this improves both stamina and co-ordination.
6. **Sit-ups** - The performer completes as many 90 degree sit-ups as possible in 30 seconds. This improves muscular endurance (stamina).
7. **Triceps dips –** The performer begins in the starting position, which consists of facing backwards to the bench, with knees bent and feet on the floor and hands places behind grasping the edge of the bench. The performer must complete as many triceps dips as they can in 30 seconds (by bending the elbows and using the triceps to lower and raise the body towards and away from the floor). Improves static strength.
8. **Bicep Curls –** In my circuit, I will use a 3kg weight in the palms of two hands to lift up towards the chest and down until upper and lower arm make a right-angle with each other (biceps used). Whichever weight is used the performer must complete as many bicep curls as possible within the 30 second time. Improves static and dynamic strength.
9. **Speed Bounce –** In my circuit I will not use a speed bounce triangle, as their number is limited and so not all 4 people in my group can use them at the same time. But I will simply jump over a 25cm distance repeatedly with a slight raise of the feet for 30 seconds. Improves stamina and works the gastrocnemius muscles.
10. **Chest passes against a wall** - This activity requires the performer to repeatedly throw and catch a netball against a wall (using chest pass) for 30 seconds. I will stand 1m away from the wall. It is a skill related activity and will improve reaction time and hand and eye co-ordination.

Monitoring my Training Programme

This section of the project includes table of results, to show my varying results, improvements and will be necessary to complete graphs and make comments on scores, changes and patterns. It also includes my personal comments about each week's performance, anything which went wrong or seemed out the ordinary. Recordings of heart rate which occurred for each session will also be listed and graphed as well as final concluding statements and summaries of overall results.

Table of Circuit Activity Results

Exercise	Session 1	Session 2	Session 3	Session 4	Session 5
Shuttle Runs	11	10	11	11	13
Step-ups	31	32	33	33	41
Ladies Press-ups	20	20	21	20	27
Ladders	5.5	6.5	6.5	7	8
Skipping	53	60	48	65	60
Sit-ups	19	24	24	18	27
Triceps dips	21	19	22	20	25
Bicep Curls	26	27	29	28	34
Speed Bounce	32	68	55	57	74
Chest Passes	20	35	31	34	38

Initially, from just viewing my table of results, I can say that most of my results (for each activity over each session) appear to vary slightly but on the whole are of about the same level. However, I have noted a few differing results which do not seem to fit the pattern. One being the chest passes (for session 1) and another being skipping (for session 3). Also, my results for session 5 are all relatively higher compared to the previous 4 sessions, but there is a reason for this which is explained below, in my personal comments about each session.

Personal comments about each session

Session 1

As this was the first time the planned circuit had been tried and tested, my results were bound to differ slightly to the next few sessions. Also, I have never completed a set training programme before and therefore was not entirely clear about the set up. Despite, these first thoughts, my results for session 1 compared to the other sessions are pleasingly similar. The only major difference is in the chest passes from session 1 to session 2, as the number completed in 30 seconds increased rapidly from 20 to 35. The reason already explained is why I think these scores differed so greatly. Overall, I found that the order of activities worked reasonably well and was well balanced. On the other hand, I think the group wasn't so well organised as for some activities there was a shortage of equipment. I hope and aim for this will be sorted out next week, e.g.

ladders and netballs for chest passes. Next week, I will have to get the netballs from the leisure centre before the warm-up and session starts. The day following the circuit, I did find that my arms ached a little (mainly biceps). I would predict that this was because I am not used to carrying out activities such as weight-lifting (bicep curls) or press-ups.

Session 2

Everything ran as planned in session 2. I managed to get the netballs before the session commenced, so that they were ready for when I needed them and the organisation of equipment and activities was much more fluent, which will have hopefully increased the accuracy of my results, as each activity was started and stopped at the correct time. The increased level of organisation meant that there was time left at the end of the session to record recovery heart rates, which will be useful when plotting graphs and comparing the number of repetitions completed for each activity and heart rates. Fortunately, I did not feel any aches or pains neither during the training session nor after.

Session 3

For this session, heart rates were measured throughout the circuit at intervals of the 2nd, 4th and 6th activities, as well as carrying on the recording of recovery heart rates. All of the activities went to plan, apart from the skipping. My results lowered from the last two sessions to 48 skips in 30 seconds. I believe the reason for this was the skipping rope being too big. Fortunately, I did not feel any aches or pains neither during the training session nor after.

Session 4

During session 4, heart rates were measured throughout the circuit at intervals of the 3rd, 5th and 7th and last activities, as well as the recovery rates after completing the circuit. The only score which appeared to be quite a lot lower than the previous 2 sessions was for sit-ups. However, I believe this was because, for some reason, I didn't have the bars to hold down my feet and stop them from lifting off the ground, meaning I had to have more control. This meant that each sit-up was taking longer to achieve, hence I completed less sit-ups this session than sessions 2 and 3 (24 sit-ups in 30 seconds for sessions 2 and 3, but only 18 in session 4). Despite this inaccurate score, because of the reason mentioned, I felt the remainder of the session went well and I completed the other 9 activities correctly, as in previous sessions.

Session 5

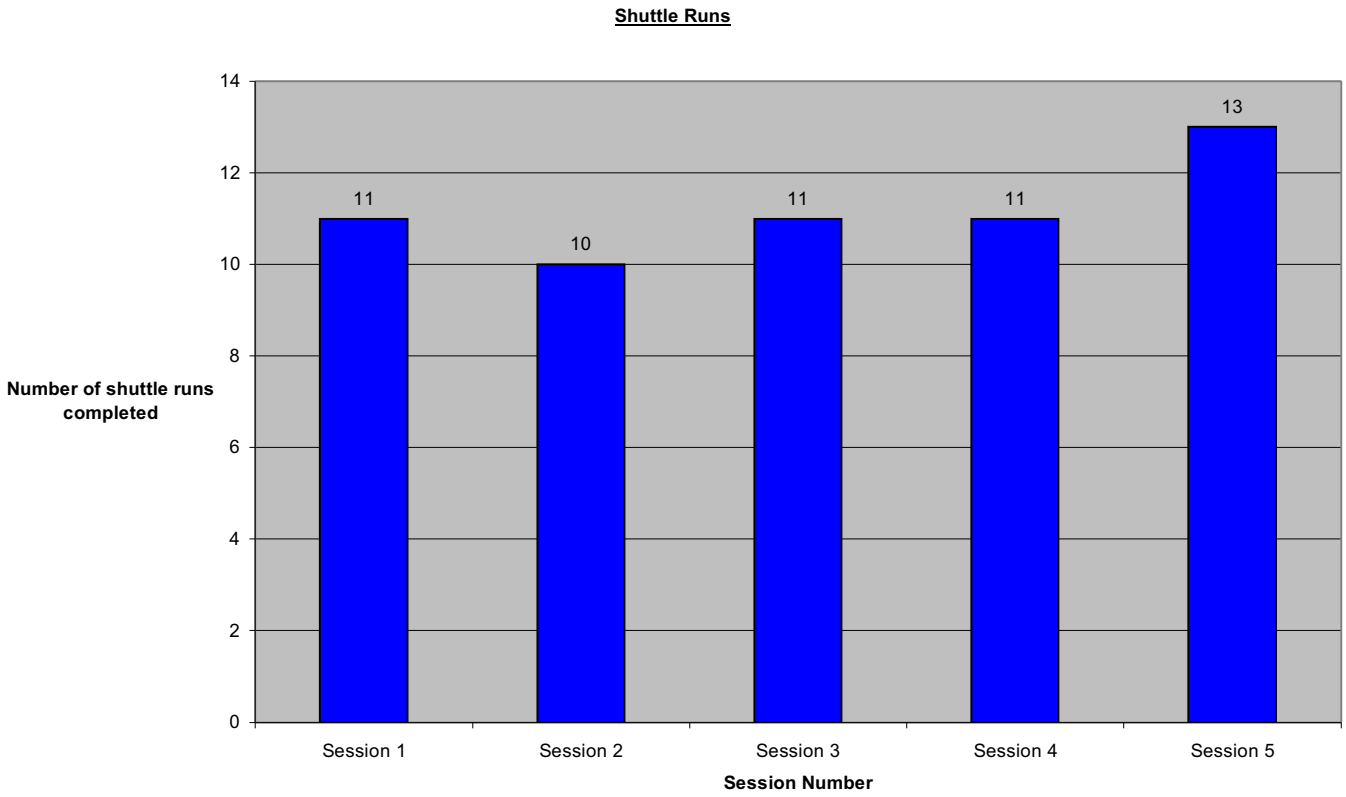
Seeing as this was the last session of my circuit training programme, it was decided that the whole class would progress to overload by increasing the length of time exercising at each station from 30 seconds to 40 seconds. Hopefully, when I go on to plot graphs and analyse all of my results, I will see how many more repetitions I managed to do in an extra 10 seconds. From briefly observing my table of results, I can see that most of my scores increased (some more than others). This was except for my skipping score which decreased by 5 skips.

Nevertheless, I have an explanation for this. In contrast to my skipping rope being too large in session 3, I found the skipping rope was too small in this session and therefore affected the number of skips I could achieve in the increased time period of 40 seconds. In addition, in comparing my heart rates and recovery rates, I can clearly see that they didn't seem to increase after activities 3, 6, 8 and 10, even though the time of exercising was increased by 10 seconds, in order to encourage overload. I can suggest two reasons for this, perhaps the time wasn't increased enough, and so I was fit enough to do more repetitions without my heart rate rising more rapidly, or on the other hand, perhaps as the time limit was increased my muscles fatigued at 30 seconds, making me work at a slower pace, hence my heart not increasing to a significantly higher rate. This initial observation will be analysed more thoroughly in my main analysis of results section (including graphs, comments and final conclusions).

Main Analysis of Results

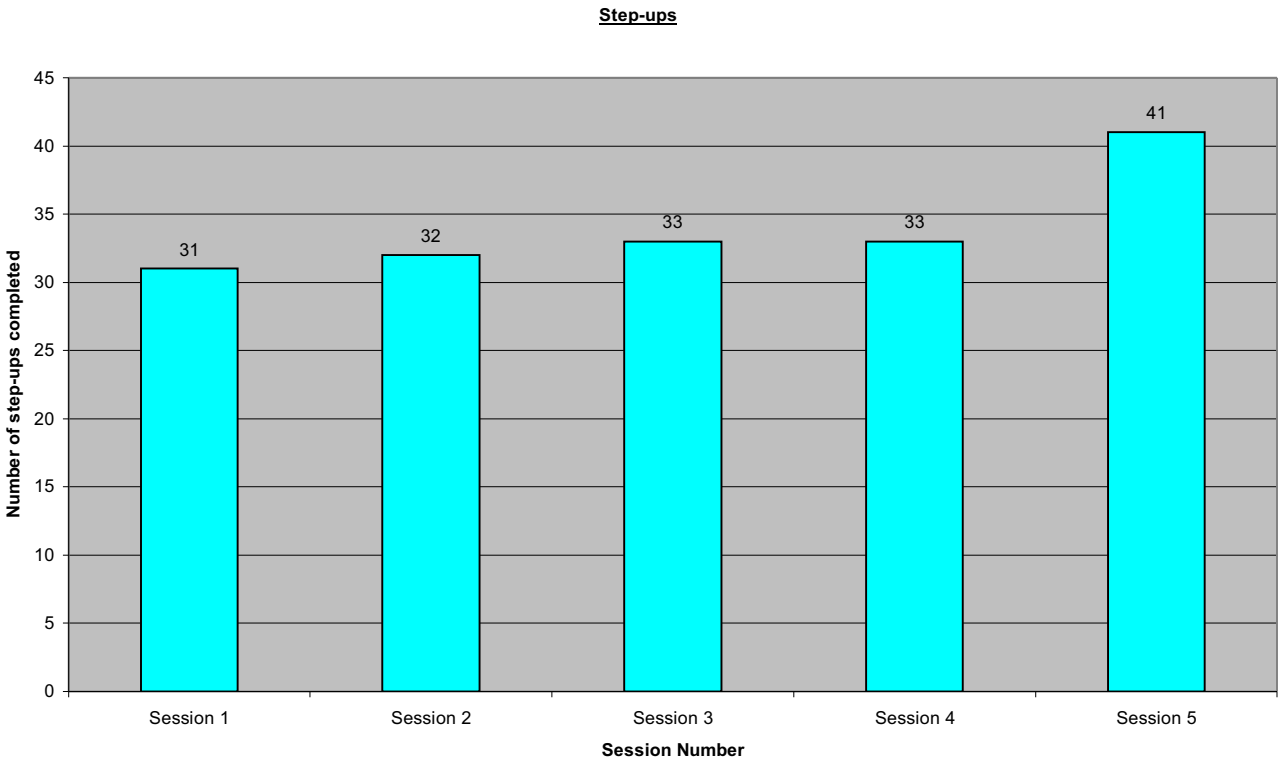
In order to accurately and precisely analyse my results for each activity across the 5 sessions, as well as my heart rate level, I will need to plot a variety of graphs. Firstly, below are 10 different bar charts (created on Microsoft Excel) to represent the fluctuating results I recorded for each activity throughout the 5 session circuit training programme. Following each of them are some brief comments which analyse the graphs in some detail and following the 10 graphs and comments is an overall summary of my results.

Graphs of Results



Comments on Shuttle Run Graph

From the bar chart on the previous page, I can observe that my scores from session 1 to session 4 are generally quite equal (11,10,11,11). This indicates to me that I worked at approximately the same level of endurance throughout the 4 sessions. As already explained, by session 5 the duration of each activity was increased from 30 seconds to 40 seconds, hence my higher score of 13 here.

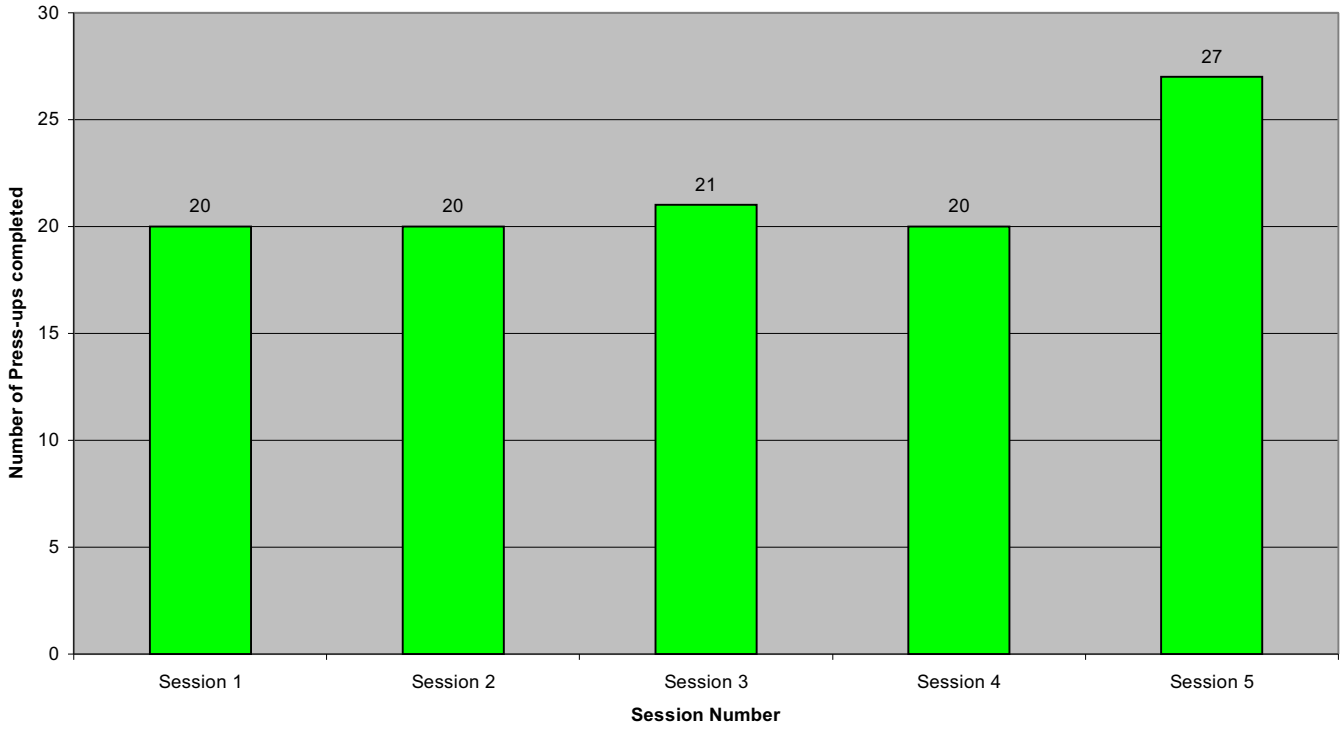


Comments on Step-ups Graph

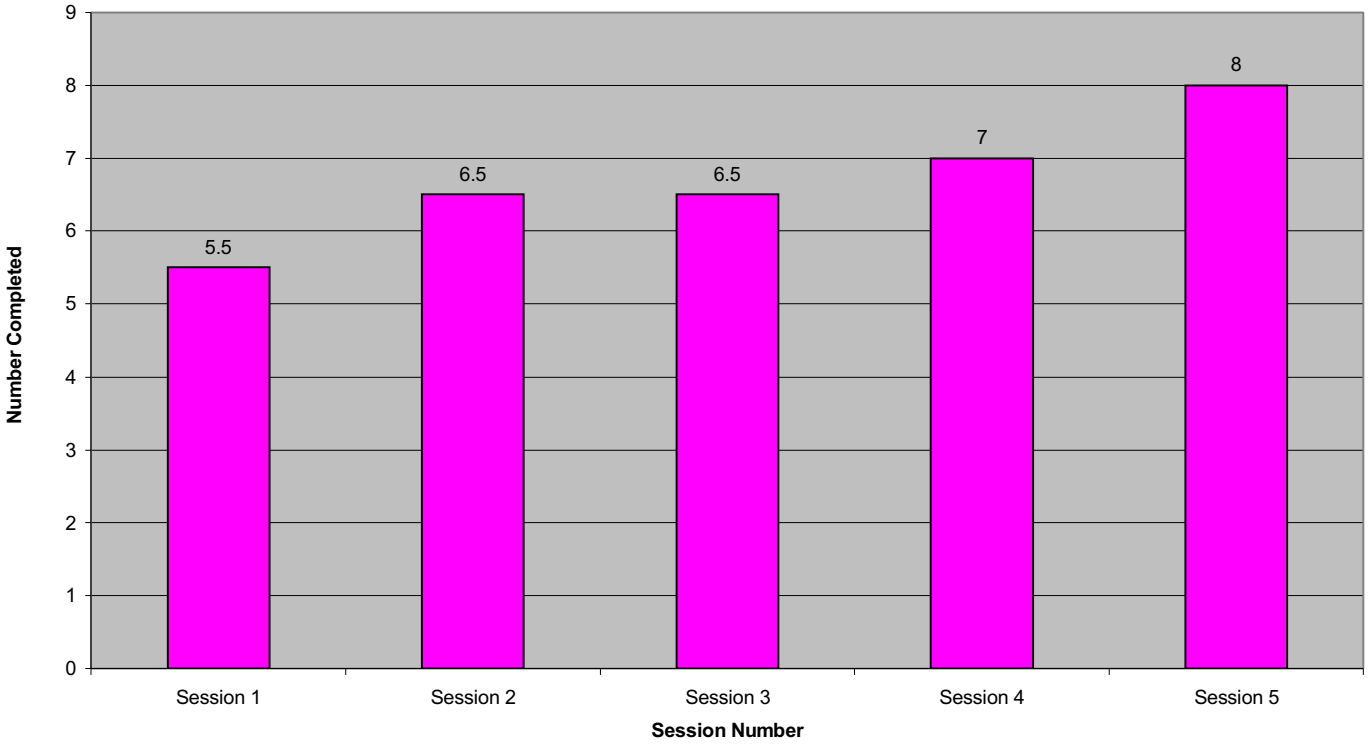
From the above bar chart, I can analyse that, again, in sessions 1-4 I completed a similar number of step-ups (31,32,33,33). This proves, again, as my scores are consistent, I must have worked consistently at the same level of intensity throughout each training session when at the station for step-ups. In parallel with my shuttle runs, from the bar chart I can see that the number of step-ups completed in the increased time of 40 seconds, have risen to 41.

As both of the above graphs (for shuttle runs and step-ups) appear to follow the same or similar pattern, I have chosen not to comment on each graph individually (unless the pattern appears different) and, instead produce an overall comment after creating all of the graphs.

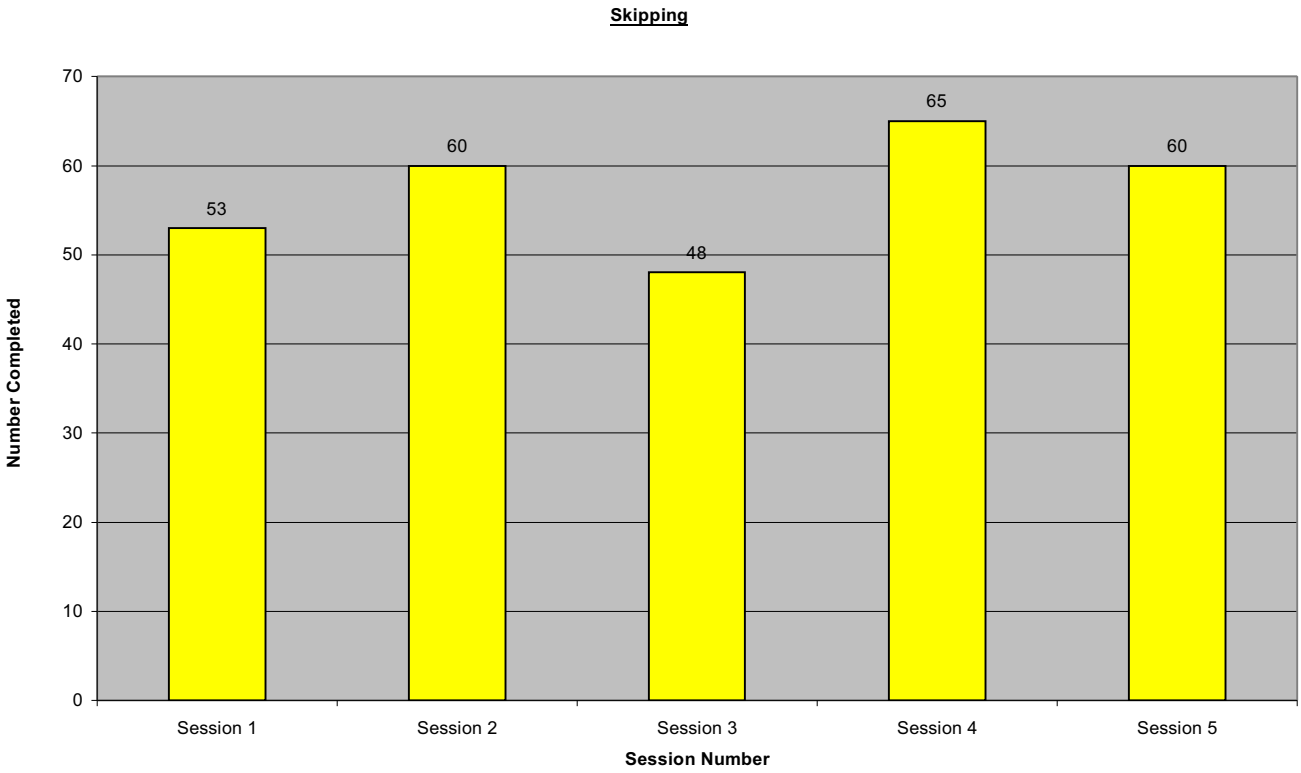
Ladies Press-ups



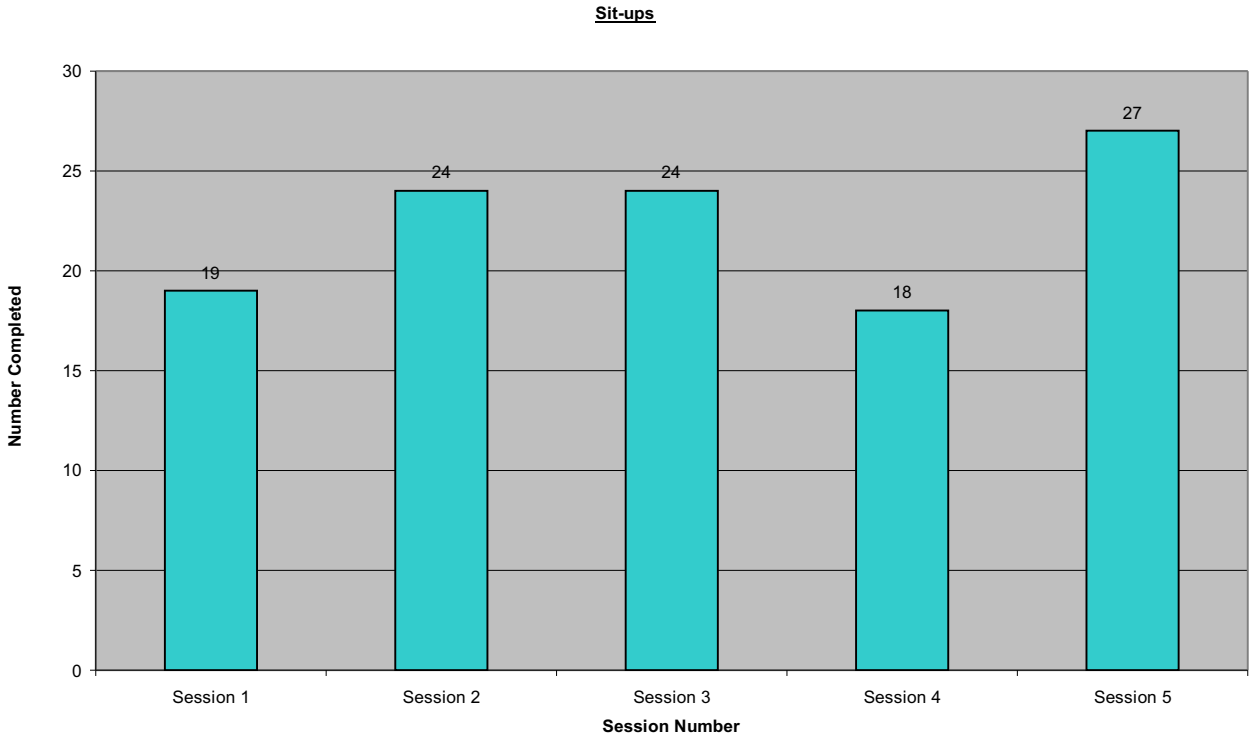
Ladders



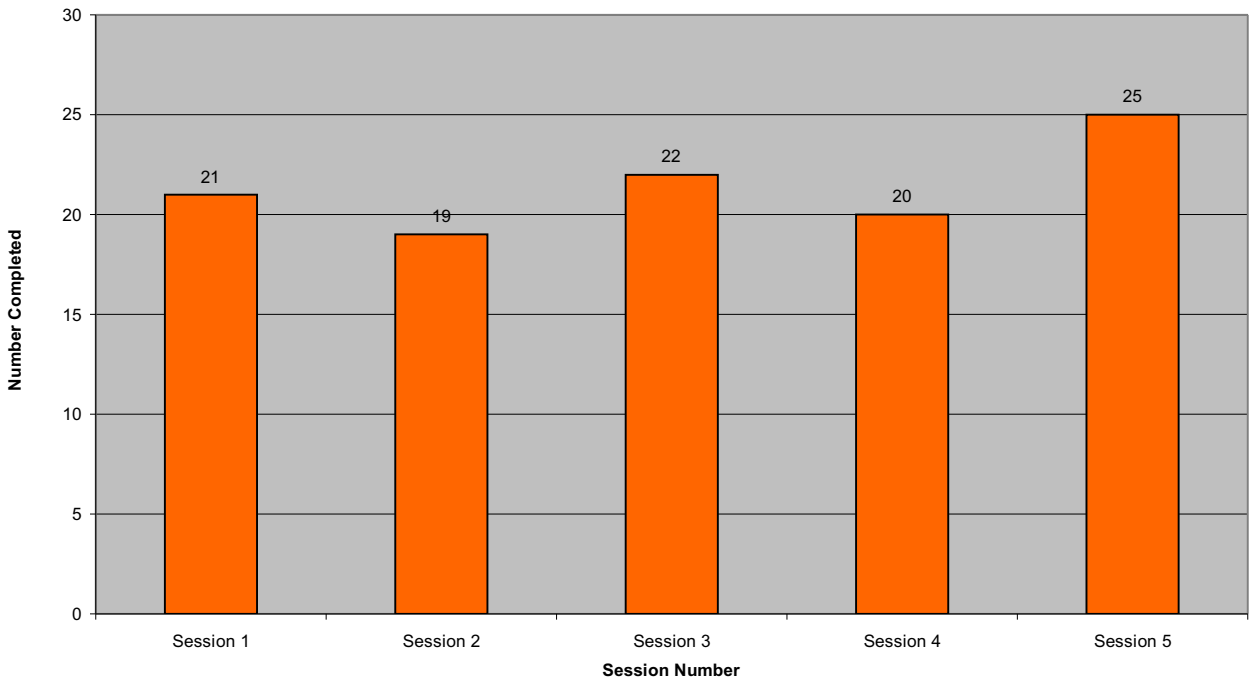
The results for ladders, as shown on the previous pages' bar chart, are one set of results where the number of ladders completed increased with each session (excluding session 2 and 3, where my scores remained at 6.5). From this data, I can suggest that my fitness level for agility was increasing with the extra training given through the programme.



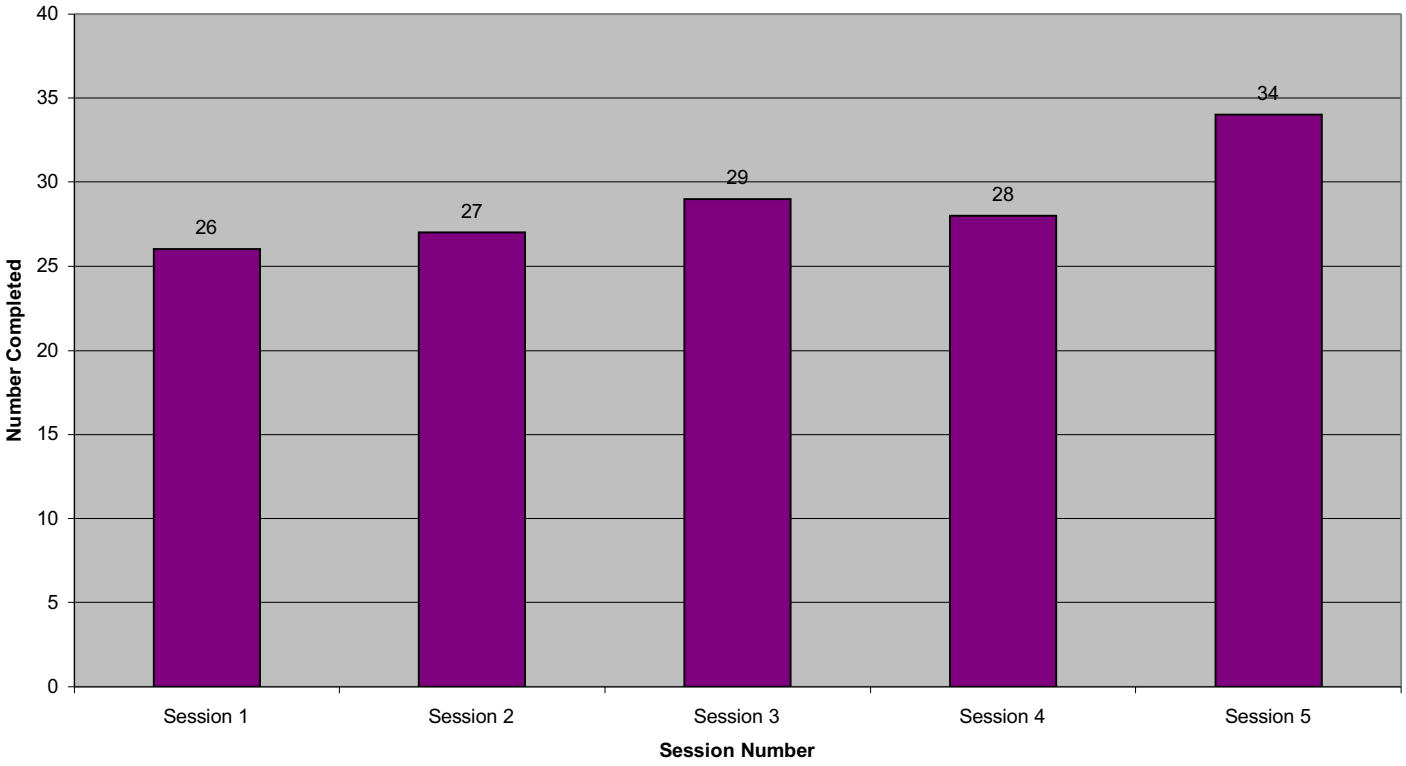
As the above graph (for skipping) doesn't match the previous graph's patterns, I need to comment on why this is. As already mentioned, in my brief comments about each session, in session 3 skipping did not go completely to plan, as I obtained a skipping rope which was too big, hence my score was affected. This is why the score for session 3 is a larger degree lower than my first two scores. Also, affecting my score for session 5 was the size of the skipping rope. This time it was a little too small and so, although the duration spent at each station exercising was increased from 30 to 40 seconds, my score remained similar to the previous session's scores which were taken after completing a 30 seconds skip.



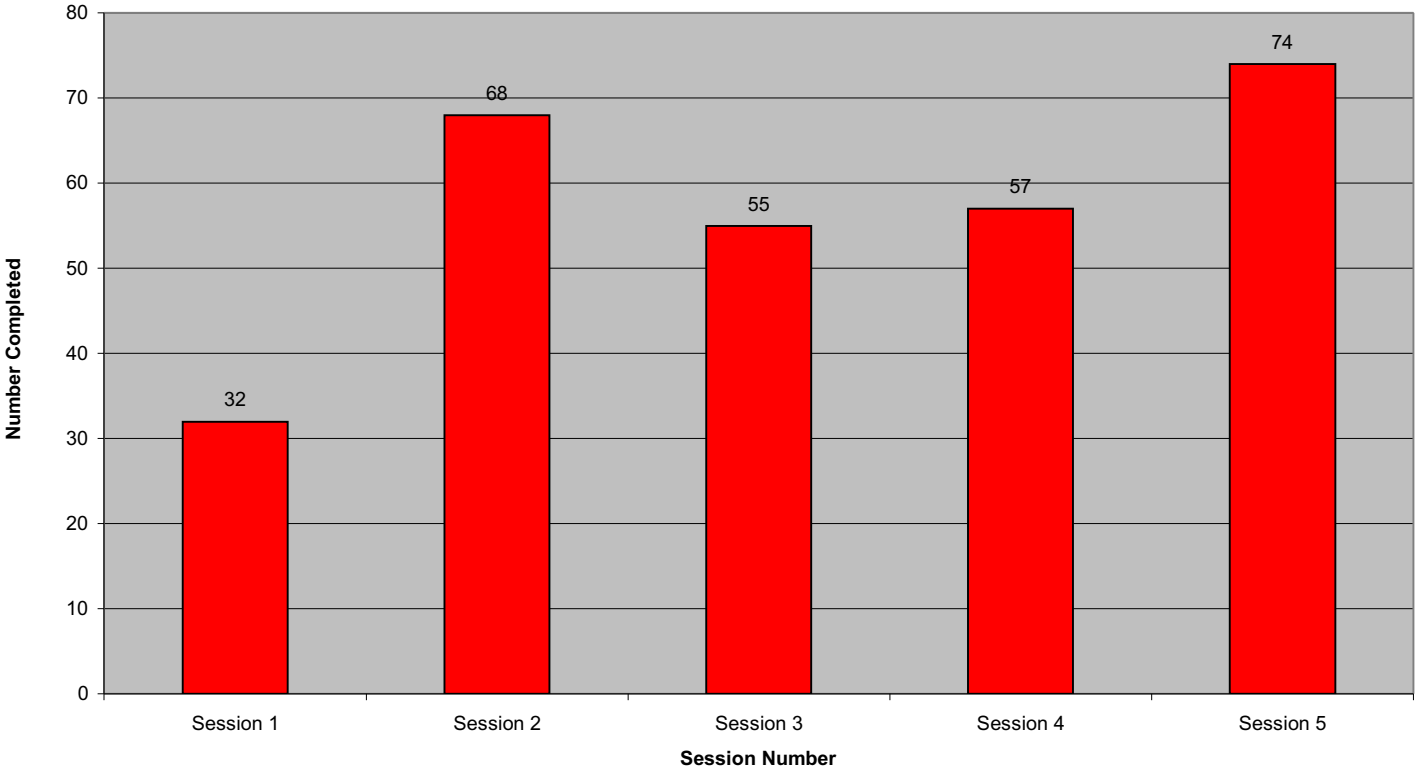
As for the graph for skipping, I feel it is necessary to refer back to my explanation for why my results for sit-ups are slightly more varied than the clearly patterned results for shuttle runs, etc. Again, in my brief comments about each session, I clearly explained the reason for session 4's results being a lower (which the graph above shows) than sessions 2 and 3. In addition to session 4's results being slightly out, session 1's results were too. I believe this could be because it was the first session and I was perhaps slightly unsure of the correct sit-up position and show this influenced my score.



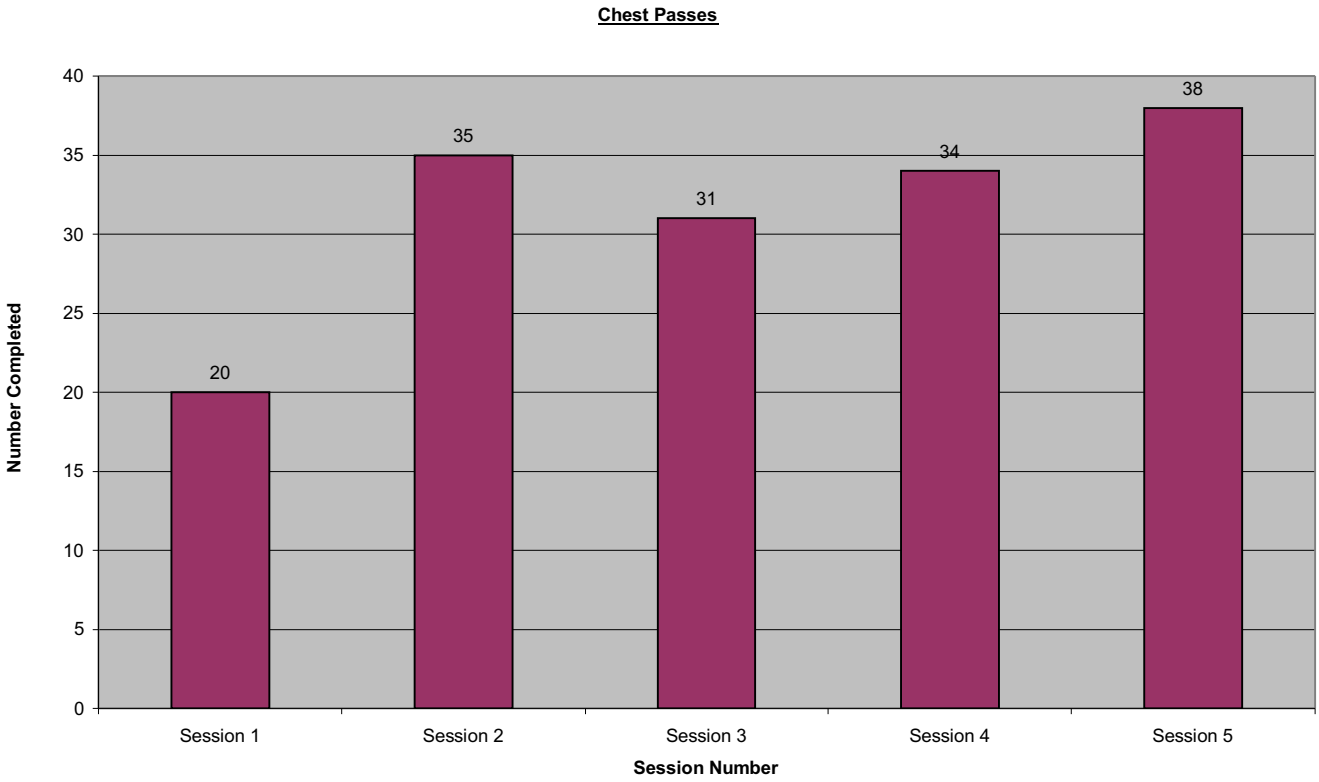
Bicep Curls



Speed Bounce



From the graph of my results for the Speed Bounce, over the 5 sessions of my training programme, I can see that the number of bounces achieved fluctuate a lot. In session 1, I believe this was because I wasn't entirely sure how to count the bounces and counted two jumps (i.e. passing over the marked line twice) as 1 by mistake. If this was so, I would have actually completed 64 bounces, a much more accurate score compared with the following sessions. As for session 2, 3 and 4 I think that my scores differ as the actual height of jump was not measured and only estimated by myself (as I didn't use a speed bounce triangle because they were in short supply). My estimation of how high I would jump is not a very accurate measure, hence my inaccurate results. In the evaluation I will explain how I could stop this from happening, if I were to carry out the training programme for a second time.



From the above graph, for chest passes, I can clearly see that my results for session 1 are fairly lower than those for the rest of the sessions. In my opinion, this was because I was slightly unsure of the activity, as it had not been practised before, and so was more cautious with throwing and catching the ball. My scores don't particularly increase as the number of sessions does, until overload is introduced, so this proves that the lower score of 20 is an anomaly.

Overall Summary of Results

To conclude my monitoring section, my results (on average) were similar for each session, with some activities' scores improving as the session number increased, up to session 5, where they increased rapidly as I introduced the principle of overload.

Heart Rate Graphs

I have chosen to present the data for my heart rates recorded in the training sessions in a slightly different way. My initial heart rate, before beginning the programme will be presented simply in a table, as I do not feel it necessary to show this in a graph. This is because there are only 5 figures to record.

Table of Heart Rate before beginning the circuit

Session	Starting Heart Rate
1	120
2	100
3	100
4	90
5	80

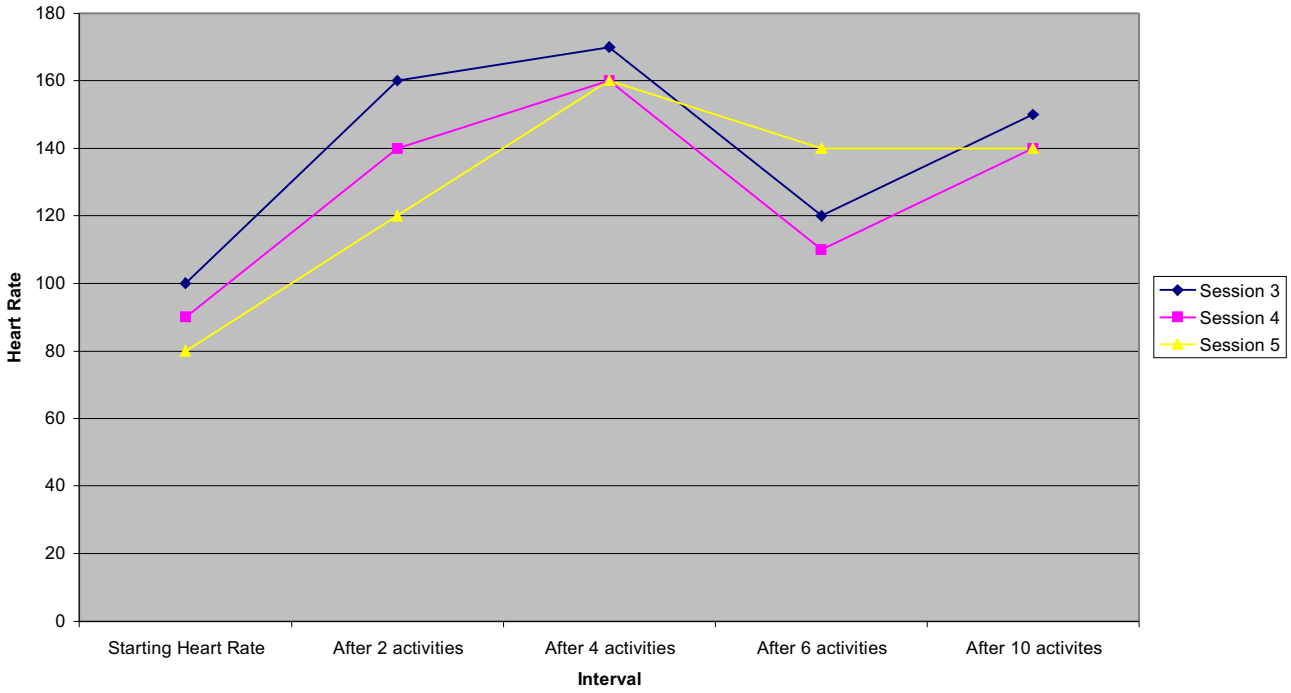
From the above table, I can observe that as the session number increased, my heart rate decreased. This shows that as I completed the programme more times, my fitness increased, as having a lower heart rate indicates a fitter person. In this way, I can clearly see that the programme has benefited my level of fitness and therefore, should in theory, benefit my performance in Netball.

In addition, pulse rates were also recorded at different intervals throughout the different sessions, i.e. after the 2nd, 4th, 6th and 10th activities, in order to monitor and later compare how heart rates changed whilst completing the circuit. However, these heart rates were only recorded in sessions 3, 4 and 5. I have chosen to create a line graph, which is shown, explained and compared to the graphs of my activities' results on the following page.

Firstly, here is a table of my heart rates at different intervals throughout the circuit:

Session	Starting Heart Rate	After 2 activities	After 4 activities	After 6 activities	After 10 activities
3	100	160	170	120	150
4	90	140	160	110	140
5	80	120	160	140	140

A line graph to show my heart rate at different intervals during 3 sessions of the training programm



Comments on Line Graph

My graph shows that after 2 activities, there was a steep increase in heart rate in all sessions. This shows that as my muscles were respiring at a faster rate, I needed to breathe in more oxygen in order to be pumped around my body by the heart and transfer more energy to the working muscles. Hence, my heart rate increased. The gradient was greater between not exercising and after the first activities, than between "after 2" and "after 4 activities."

In addition, there was a reduction in my heart rate from 4-6 activities. This indicated the activities were less strenuous here, my muscles did not require as much energy and therefore my heart rate decreased as not as much blood (containing oxygen and glucose for respiration) was needed to be pumped around my body to the working muscles in a given period of time.

From 6-10 activities, my heart rate is shown by the graph to have increased (for all 3 sessions) at a fast rate, as indicated by the gradient of the graph. This is, primarily, because there are 4 activities between the 2 intervals.

However, all of the pulse rates taken may not be very accurate, as I did them by hand, rather than using some kind of heart rate monitor, which would have been more accurate.

Monitoring Recovery Heart Rate

Following sessions 2-5, recovery heart rates were recorded 1, 2 and 3 mins after completing the circuit. This was in order to determine the period of time taken for the heart to recover back to its resting pulse rate. The following table shows my recordings of recovery heart rates.

Session Number	Starting Heart Rate	Recorded recovery heart rates		
		After 1 min	After 2 min	After 3 min
2	90	120	140	90
3	100	130	110	100
4	90	130	120	90
5	80	130	110	80

From the above table, for all 4 sessions, I recovered to my resting pulse rate after 3 minutes. However, my pulse rate after 1 minute varies, hence varying pulse rates after 2 minutes, before reaching my starting pulse rate. I could suggest that this is because, in some sessions I had more energy, as I was less tired or had eaten more food, etc so I found it easier to exercise at the same rate as in another session, where I was more tired and had eaten less, etc. For example, in session 2, my resting pulse rate is at 90 and my recovery heart rate after 1 minute is at 120. This is lower than in sessions 3 where my resting pulse rate was 100 and after 1 minute of recovering this was 130. These examples of results support my suggested reason for why my pulse rates vary.

Evaluating my Training Programme

1) Evaluating the planning of my programme

Firstly, in the fitness tests, which I completed prior to completing the training programme, I performed as well as I could. I displayed my results for these tests in the planning section (page references 4 and 5), even so here is a simplified table of my results:

Name of Fitness Test	Type of Fitness	My Score
Alternate Hand Wall Toss Test	Co-ordination	17
Illinois Agility Run	Agility	20 seconds
The Stork Stand	Balance	23 seconds
Standing Vertical Jump	Muscular Power	30
The NCF Abdominal Curl Test	Muscular Endurance	27
The Sit and Reach Test	Flexibility	32

I will compare these scores later, during the evaluation, to my scores for the same fitness tests, after completing the training programme.

Was the level of my training programme appropriate?

I think my training programme was perhaps too easy for my level of fitness, as I did not seem to become too tired or my muscles didn't appear to become fatigued after completing it on any of the 5 sessions. This signifies to me that I did not have to respire anaerobically during the sessions, as my body could breathe in and transport oxygen quickly enough to my working muscles without having to go into anaerobic respiration; hence I was not working to my highest training zone. Therefore, I believe my training programme could have been increased in some way; either by increasing the intensity, duration of activities or number of sessions completed each week, to either progress to a higher level or to overload. This action was not taken until the last session of my training programme, and I noticed an increase in the majority of my scores.

How did I include the principles of training when planning my programme?

As already explained, in my planning section, I considered and used the principles of training (e.g. specificity, progression, overload, reversibility and tedium and the FITT principle) when planning my training programme. I designed the various activities specifically for my chosen sport, netball as well as introducing the principle of overload in session 5 by increasing the duration of each activity by 10 seconds. However, I don't feel my programme included the principles of progression and tedium, as in none of the session apart from the 5th, were attempts made to progress the programme and ultimately my fitness to another level. Similarly, tedium was not assessed greatly and I do feel the programme became a bit boring at times, which could have made my performance decrease. On the other hand, the FITT principle was used

throughout the programme in a constant way, as the frequency, intensity, time and type of exercises were kept the same for 4 sessions. This was to enable me to acquire accurate and comparable results.

The reasons for the activities chosen for my training programme are explained in my planning section (page 7) in relation to my chosen sport, netball and displayed with the type of fitness intended to be improved, in the table on page 18.

2) Evaluating the Performance of my programme

Overall, I think that my training programme ran fairly successfully. Comments on each session are shown as part of the "Monitoring" section of the programme (on pages 20-22). These explain, in significant detail, my thoughts on each session and how the activities went.

How appropriate were the order of activities within my programme?

After having completed 5 sessions of my designed training programme in order to improve my performance in Netball, I found the order of activities slightly unbalanced. This was because I think the more strenuous, aerobic activities were at the start of the programme (i.e. shuttle runs, step-ups, press-ups, ladders and skipping) whereas as the programme comes to an end, the activities appeared to become less strenuous (i.e. triceps dips, bicep curls, speed bounce and chest passes). However, this could just be how I found the order. Nevertheless, I think that if I were to carry out the 5 session training programme again, I might alter the sequence of activities, in order to balance the programme.

Was the programme enjoyable?

On the whole, the programme was quite enjoyable. This was as I completed the activities alongside friends. But, I think the programme would seem more enjoyable and less tedious if it were done to music, which I believe would make the programme more exciting! I did also find it hard to maintain interest and music would enable me to stay more focused in way, as well as allowing me to relax more.

3) Evaluating the monitoring of my programme

As mentioned previously, I increased the duration of the activities from 30 seconds exercise to 40 seconds exercise. This was to reach overload. I'm not entirely sure whether overload was reached, but there was certainly a progression in the number of sets of many of the activities completed. For example, from my bar chart on page 22 I identified an increase in the number of shuttle runs completed for session 5 from 11 to 13. Also, on page 23, from the bar chart for step-ups, my score increased in session 5 from 33 step-ups to 41. However, there were also some activities where my scores did not increase from session 4 to session 5. For example, in session 5 for skipping (see bar chart page 25) my score actually decreased from the previous session, although my scores for all sessions varied for skipping. The reasons for which are explained in the comments on the graphs and comments on each session section.

As already explained, in the monitoring section, I recorded my starting heart rate for all the sessions (1-5). When looking at this, I observed that as the session number increased, my heart rate decreased. This shows that as I completed the programme more times, my fitness increased, as having a lower heart rate indicates a fitter person. In this way, I can clearly see that the programme has benefited my level of fitness and therefore, should in theory, benefit my performance in Netball.

In addition, and as previously presented and explained in the monitoring section, I also recorded my heart rate during the circuit training programme in sessions 3, 4 and 5. My line graph of results (on page 30) showed a similar pattern of my pulse rate for all 3 sessions, hence indicating that I exercised at a similar rate in the sessions. However, the lines for sessions 4 and 5 are at a lower pulse rate overall than the line used to represent sessions 3. This shows that as I completed the circuit more times, my heart rate was decreasing when doing the same amount of exercise and therefore my fitness must have been increasing.

Finally, recovery rates were also recorded after sessions 2, 3, 4 and 5. The results of these are shown in the table on page 31 and also explained thoroughly.

4) Final Evaluation

Following completion of the training programme, both a multi-stage fitness test and other fitness tests have been carried out, in order to assess fitness after completing the training programme. Improvements can be seen.

Unfortunately, I did not have the chance to complete the multi-stage fitness test prior to doing the circuit training programme, and so therefore cannot equally compare my result from it after having done the programme. However, in Year 10 I did do the bleep test and I reached level 6.9. So, basing my comparison on this score, I can say that my fitness has greatly improve since then to now, after completing the training programme. This is because; I achieved level 9.1 in the bleep test a few weeks after finishing the programme, which is a great improvement on my last score.

I can draw several conclusions from this, one being that my stamina must have increased, which was the main component of fitness I was aiming to improve. Secondly, my mental stimulation could have improved, as being more determined allowed me to carry on running an extra 2.2 levels. Also, my training zone has almost undoubtedly risen, as I was able to obtain a higher level of exercise for a longer period of time, without my muscles becoming fatigued by anaerobic respiration. My aerobic respiration efficiency has also increased, as I did not become tired so quickly, therefore my heart is more efficient at pumping blood around my body, hence my heart rate remained lower for longer as it could pump more blood around my body without having to work as hard as before.

All of the above effects are very positive effects of exercise on my body, but these will only remain constant if I continue to training hard and at the same level as I am at the moment. Increasing the amount of exercise I do will, ultimately, increase my level of fitness even more!

Furthermore, I also carried out the same fitness tests which were completed prior to completing the training programme. My two sets of results are compared in the table below:

Type of Fitness	Fitness Test	My score prior to programme	My score after programme	Improvement?
Co-ordination	Alternate hand wall toss test	17	20	Yes
Agility	Illinois Run	20 seconds	19.1 seconds	Yes
Balance	Stork Stand	23 seconds	25 seconds	Yes
Muscular Power	Standing Vertical Jump	30	32	Yes
Muscular Endurance	The NCF abdominal curl test	27	28	Yes
Flexibility	The sit and reach test	32	33	Yes

All of my scores were an improvement, indicating a higher fitness level, therefore I have achieved my target!

What changes would I make if I were to do the programme again?

If I were to carry out the programme again, I would make some changes:

- Ensure correct instructions were made apparent – to allow activities to run smoothly from the first session and achieve more accurate results and make more accurate conclusions.
- Use the correct equipment – make sure for each session there is the right equipment to use, as used in the previous sessions. Again, this is to obtain more accurate and reliable results.
- Even though I felt I worked at a relatively similar rate for all of the 5 sessions, if I were to carry out the programme again I would more precisely ensure that a consistent approach to activities was made.
- In order to achieve more accurate measures of heart rate (whether it be at the start, during or after each session) I would use a heart rate monitor.
- Also, I would be more organised with taking pulse rates and make sure at the start, during (at the same intervals) and after the sessions the necessary rates were taken and recorded correctly, so that it would be much easier when presenting and analysing results.
- I would possibly change the method of training, in order to vary the activity and prevent the principle of tedium occurring. For example, interval training.
- Evidently, I would either change to main component of fitness to improve in a particular sport, i.e. flexibility or strength. This would be to progress further with my fitness training.
- Finally, in order to make the programme more exciting, I may add other equipment such as a CD player (probably would be for use indoors) so as I could listen to music whilst exercising to encourage a more willingness to exercise hard as well as a more relaxed atmosphere.