Importance of fitness testing

- Gives baseline data for monitoring/improving performance

- Can design training programmes based on test results and determine if training programmes are working

- Results can give a performer something to aim for/goal setting
Pre Test Procedures

1) Checking the equipment

2) Informed consent

3) Choosing the fitness tests

4) Carrying out the fitness tests

5) Reliability and Validity of fitness tests.
Flexibility
Sit & Reach Test

What you need? A box and a measuring tape or a sit and reach table.

How do you do the test? Sit comfortably with legs straight in front of your feet flat against the box, with your with the measuring tape in line you must reach as far forward without bending your legs. No jerky allowed and held for 2 seconds. 3 chances, taking best result. The distance is measured where your fingertips reach.

This test is measured in centimetres or inches. Average 16-19 male is 7-10cm and female 7-11cm.

Advantages - Well known test, quick and easy, lots of normative data.

Disadvantages - variation in individuals arms, legs, trunk can be create misleading results, only measures flexibility in the lower back and hamstring and no other body parts.
What do you need? A grip dynamometer

How do you do the test? Use a grip dynamometer to measure grip strength. Record the reading from the three attempts using dominant hand.

Measured in Kg or KgW depending on dynamometer used. Average 16 - 19-year-old male is 30-35kg and female 22-26kg.

Advantages - simple test and easy to conduct, lots of normative data.

Disadvantages - Dynamometer has to be adjusted for hand size, if not done correct can result in inaccurate results.
Aerobic Endurance

Bleep Test

Definition of VO2 max (ml/kg/min): the maximum amount of oxygen uptake, usually measured in ml of oxygen per kg of body mass per minute. It is a measure of cardiorespiratory endurance.

What do you need? Multistage Fitness test CD, player, cones 20 meters marked out.

How do you do the test? It involves continuous running between two lines marked at 20 metres in time with a pre recording of bleeps. The time between the bleeps decreases. You must make sure you reach the line in time with the bleep (foot on the line). If you arrive before the bleep you must wait for it before resuming run. If you don’t make it to the line in time with the bleep you are given 2 or 3 attempts before being stopped.

Advantages - large groups, measures maximum capacity

Disadvantages - practice, motivation and state of mind can influence the score. It has reliability and validity flaws. Can be subjective.
Aerobic Endurance
Forestry Step test

- **What do you need?** Step (40cm males, 33cm females), heart rate monitor, metronome, calculation scale for results.

- **How do you do the test?** Record your body weight at the start. Set the metronome at 90 beats per minute to work out a stepping rate of 22.5 steps a minute. Follow the stepping rate step up right and then left, this is one step. Continue for 5 minutes. At the end measure your heart rate. Use your age, post-exercise heart rate and body weight to calculate maximal aerobic power. **Definition of VO2 max (ml/kg/min):** the maximum amount of oxygen uptake, usually measured in ml of oxygen per kg of body mass per minute.

- **What does it measure?** It is a measure of cardiorespiratory endurance.

- **Advantages** - simple test requiring minimal equipment, performed inside or outside and can be self-administered.

- **Disadvantages** - some people may not have fitness level or coordination to maintain stepping rate, people are different heights.
Speed

35- metre sprint

What do you need? 35-metre section in a straight line, stopwatch

How do you do the test? Sprint 35 metres from standing start. Complete this 6 times each with 30 seconds rest period.

This is measured in seconds (s). There is no set data however a difference of 0.8 seconds between first sprint and 6th sprint represents excellent performance.

Advantages - simple test, performed inside or outside

Disadvantages - human error in timekeeping.
Speed & Agility
Illinois Agility Run

What do you need? Non slip surface, cones, stopwatch

How do you do the test? Set up as shown. Starting at the start face down complete the course as quick as possible when told to ‘Go’. Stopwatch is stopped when cross the finish line.

Advantages - it is cheap and easy to conduct

Disadvantages - human error can lead to inaccurate timings and if done outside weather can effect conditions.
Anaerobic Power
Vertical Jump Test

What do you need? Wall, measuring tape, chalk, partner and weighing scales

How do you do the test? Stand side on at the wall and reach up with hand closest to the wall and mark where your fingertips are. This is your standing reach point. Stand away from the wall and jump vertical as high as possible touching the wall at the highest point and mark. Measure the distance between standing reach and the highest mark jumped. Get three attempts. Best result is plotted on the nomogram (above) on line 'D'. Weigh yourself and record that on the weight line (wt). With a ruler join the two points up and where the line cross the power line 'P' is your power result. Example on diagram.

This is measured in kilograms per second (kgm/s)

Advantages - quick and easy to perform

Disadvantages - technique used can vary, human error in marking the correct height jumped.
Muscular Endurance

One minute Press Up Test

What do you need? Stopwatch & partner

How do you do the test? In the starting position, hands shoulder width apart. On the command of 'Go' start the press up by bending the elbows and reaching the level of shoulders below the level of the elbows and return back to the start position. Your partner counts the number of full press ups.

Advantages - quick and easy, no specialist equipment needed.

Disadvantages - technique correct to count, resting in the start position can make testing simultaneously difficult.
Muscular Endurance
One minute Sit up Test

What do you need? Stopwatch and partner

How do you do the test? Lay down on the floor, knees at right angle and feet flat on the ground, hands resting in the thighs. Squeeze your stomach, push lower back flat and raise upper body high enough for your hands to touch the tops of your knees. Keep your lower back on the floor and return to starting position. Partner counts full sit ups completed.

Average 16-19 year old = Male 20-25 per min & female 15-20 per min.

Advantages - simple to perform, minimal equipment & large groups tested at once.

Disadvantages - difficult to determine when a correct sit up has been performed so can create dispute over total.
Body Composition

Jackson-Pollock Nomogram method predicting % of body fat

There is a layer of fat beneath the skin, which is called subcutaneous fat and the % of total body fat can be estimated by taking a measure of the 'skinfold' at selected points of the body with a pair of callipers.

What do you need? Skinfold Callipers & partner
Body Composition

Jackson-Pollock Nomogram method predicting % of body fat

How do you do the test?
- Measurements are taken on the right side of the body on dry skin and when relaxed.
- Mark the three areas with a pen.
- Grasp the skinfold firmly between thumb and index finger and pull away from the body. The fold should be about 1 centimetre from mid point.
- Place the callipers midway between the base and tip of the skinfold with the dial facing upwards and have a full grip on the fold.
- Read the dial to nearest 0.5mm. Take a minimum of two measurements and calculate the average.
- Add up the three results for each of the three sites measured. Plot this onto the nomogram. Plot your age on the age line and join the two points up. Where the line crosses on the % body fat scale read the result according to your gender.
Body Composition

Jackson-Pollock Nomogram method predicting % of body fat

Chest: A diagonal fold, which is one half of the distance between the anterior auxiliary line and the nipple.

Abdominal: A vertical fold, which is 2 cm to the right side of the belly button.

Thigh: A vertical fold, on the front of the thigh, halfway between the hip joint and the middle of the knee cap. The leg needs to be straight and relaxed.

Triceps: This is a vertical fold on the back midline of the upper arm, over the triceps muscle.

Suprailiac: A diagonal fold just above the hip bone and 2–3 cm forward.

Thigh: A vertical fold, on the front of the thigh, halfway between the hip joint and the middle of the knee cap. The leg needs to be straight and relaxed.
Body Composition

Jackson-Pollock Nomogram method

predicting % of body fat

Advantages - provides accurate score for body fat percentage

Disadvantages - complicated and requires specialist help, needs specialist equipment, people may be uncomfortable doing this test, can be difficult to ensure results are valid and reliable if the tester is inexperienced.
Body Composition

Body Mass index (BMI)

Your BMI provides a way of calculating whether or not your body is at an ideal weight. It is designed for men and women over 18 years old and although people under the age of 18 can use it, their results should not be taken to have any significant meaning.

What do you need? Weighing scales in Kilograms, measuring tape, calculator, partner.

How do you do the test? Measure weight in kilograms and measure your height in metres.
Calculate your BMI using following equation:
BMI = weight (kg) / height (m) x height (m)

Advantages- involves a simple calculation

Disadvantages - muscle weighs more than fat, so bodybuilders and professional athletes will often have a BMI excess of 25kg/M2 without being overweight.

The unit of measurement for BMI is kg/m²
Another way to measure body fat is to use BIA, where electrodes are attached to the wrist and the ankle and an electrical current is passed from one to the other. Body fat restricts the flow of the electric current, so the more current that is needed the greater the percentage of body fat the person has.

This method measures body composition by sending a low, safe electrical current through the body. The current passes freely through the fluids contained in muscle tissue, but encounters difficulty/resistance when it passes through fat tissue. This resistance of the fat tissue to the current is termed 'bioelectrical impedance', and is accurately measured by body fat scales. When set against a person's height, gender and weight, the scales can then compute their body fat percentage.

**Advantages** - accurately measures what percentage of your total body weight is made up of bone, muscle, fat and water. Quick and gives instant results, it can also be administered repeatedly over time without adverse effects.

**Disadvantages** - it requires expensive equipment.