



DON'T THINK YOU CAN - KNOW YOU CAN!

What is Speed?

Speed is a measure of the time it takes you to move from one point to another. This depends on your reaction time, for example how quickly you can respond to a starter's pistol, or to another player's moves. It also depends on how fast your muscles can move your joints, such as when running, or reaching for a ball. The fibres that make up your muscles are the key to your ability to work at speed.

Fast and slow twitch muscle fibres

Your voluntary muscles are a mixture of fast and slow twitch muscle fibres. This mix is why voluntary muscles are also known as 'striated' or 'striped' muscles: Slow twitch fibres use a lot of oxygen to make energy aerobically, and so are bright red. Fast twitch fibres come into play during intense, anaerobic work, so do not rely on a large oxygen supply, and are almost white.

Most people's mix of fibres is around 60% slow and 40% fast. This can vary dramatically between people, and is genetically influenced – your own mix will depend very much on what your parents' muscles are like. The mix is a large factor in performance. Fast twitch fibres are vital for speed, and slow twitch fibres deliver endurance. Based on what you know about your own performance, would you say you have more fast or slow twitch fibres?

Top sprinters can have as much as 80% fast twitch fibres, whereas top endurance athletes (like marathon runners) can have around 80% slow twitch fibres. This will partly depend on their genetic makeup, but will have been improved over time by using the right training.

The right speed for your sport

Whatever the demands of your sport or activity, you need to design your personal exercise programme for strength and stamina to suit your need to develop speed.

Aerobic capacity – low to medium intensity activity

Build your aerobic capacity by using one or more of the methods for cardiovascular training. This will help your heart to work harder, for longer, so that your muscles receive all the oxygen and glucose they need for energy. Over time, you will develop more slow twitch fibres. **Think FITT: Frequency, Intensity, Type and Time.**

Anaerobic capacity – high intensity activity

Where bursts of intense speed are vital for performance, your anaerobic capacity is critical. Use interval or fartlek training methods to mimic the demands of your sport and build your anaerobic capacity. Over time, you will develop more fast twitch fibres. **Think FITT: Frequency, Intensity, Type and Time.**

Speed, reaction, and your nervous system

Your reaction time is the time you take to respond to a stimulus. This depends on how fast your nervous system can communicate information from your senses (for example your ears or eyes) to your muscles. To improve this you need to train specifically for your sport. Your training should include a session each week that focuses on:

- Starting e.g. for runners, rowers and cyclists
- Short distances at race speed, again for racing sports
- Short sprints, for team sports
- Reaction drills, to control a ball and/or change direction, for team sports

This training also helps your nervous system to control your movements as fast as your sport requires, firing impulses to your limbs fast enough to keep up with what your new strength and stamina will allow.

The importance of recovery

Recovery is vital for speed training, especially where anaerobic training is included. Your fast twitch fibres are exhausted quickly and need time to recover. This should include short-term recovery, by including resting or low-intensity work within your speed training session. It should also include long-term recovery, by including a rest day each week and scheduling your speed training for the day after, when you are fully rested. You should also plan in recovery time after an important competition or event.



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Test sheet - Speed

Testing for speed

Testing each aspect of your fitness is a vital part of any training programme. Testing will help identify areas for improvement, monitor your progress over time, and help you to set and achieve training targets.

Before you start your training programme, test yourself using one or more of the basic tests below. Test yourself fortnightly during the programme and then again at the end of your training programme. Record your results on the test recording sheet provided. If you've planned your programme well, and you're taking it seriously, you'll see your performance improve.

General tests for speed

Timed run

The distance can be chosen to suit your sport or activity, and could be anything from 100m upwards.

Timed shuttles

Shorter distances can be timed as an indoor shuttle run, between cones 10-20m apart – again, the total distance can be chosen to suit your sport, for example the length or width of a court or pitch for ball or racquet games. Alternatively, use a 'bleep test'.

Specific tests for speed

Timed races

For race events, such as running, rowing or cycling, race performance, or timings under race conditions, should be recorded and monitored during training.

Reaction time

Measure using a metre rule drop test, recording the distance (in cm) a metre rule drops between finger and thumb before being gripped.

Skill and agility

Measure using a series of skill or agility-based tests, either the time taken to successfully complete a set number of actions, or the number of successful actions within a set time. Both skills and agility play an important part in speed in many sports, and your tests should reflect the needs of your sport.

Could you join the Royal Navy? If you meet the below fitness target you can!

	Men	Women
Sit-ups	39 - 53 (in 2 minutes)	29 - 43 (in 2 minutes)
Press-ups	20 - 26 (in 2 minutes)	17 - 19 (in 2 minutes)
Run	2.4km (in 11 min. 13 secs.)	2.4km (in 13 min. 15 secs.)
Bleep Test	9.10	7.03

Remember, these times and targets are for 16 year olds. Simply aim to do your best.



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Test recording sheet instructions

This test recording sheet can be used to monitor your improvement over time.

Enter your name and a description of the test you will use to monitor your progress.

The horizontal axis records the date of testing. You should test yourself fortnightly, and enter the date in the small boxes under the axis. The vertical dotted lines allow you to plot your result accurately over the date you completed each test.

The vertical axis records what the test measures, for example time taken. The horizontal dotted lines allow you to record your time, or other result, accurately. You should choose the units for the vertical axis so that you can record your results easily and accurately.

If you have a target, mark this as a horizontal line across the chart.

If you are timing yourself to complete a set activity against the clock (for example 60 sit-ups or an 800m run), you should aim to get your results BELOW this target line.

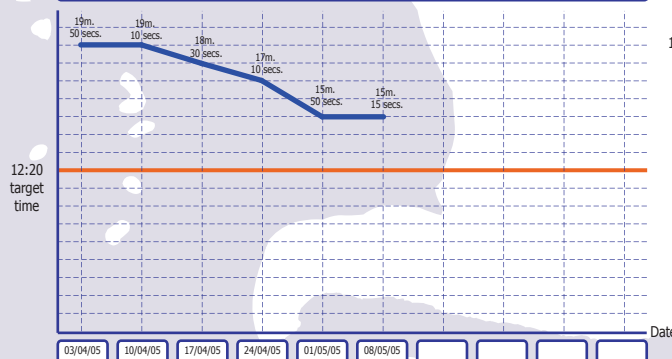
If you are recording the number of actions you can complete in a set time (for example the number of sit-ups in 2 minutes, or distance you can run in 5 minutes), you should aim to get your results ABOVE this target line.

Example: 2.4km run for a male

Name: Terry Singh

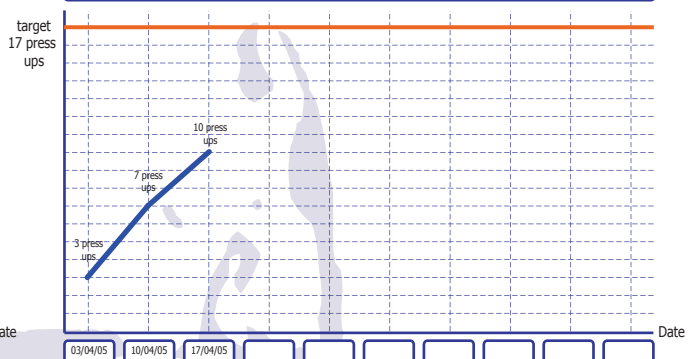
Description of test:

2.4km run
To achieve a time of under 13 minutes within a 10 week period.



Description of test:

Press ups
To achieve the target of 17 or more press ups within a 10 week period.



This person is improving:

He should beat the target time of 12 mins 20 sec around week 10 of his training programme. He should also find it very easy to beat his target of 17 press ups.

