



Application of
Fitness Testing **5**

Getting to know your unit

Assessment

You will be assessed by a series of assignments set by your tutor.

Fitness is a fundamental aspect of all sporting performance, and sports performers need to maintain and improve their fitness levels to excel in their sports. It is important that they take part in regular fitness assessments so they can establish their baseline levels and use this information to plan specific training programmes.

This unit explains the principles of fitness testing including factors affecting the selection and administration of tests, such as ensuring the validity, reliability and suitability of tests. You will explore a range of laboratory- and field-based fitness tests and the administration process of each fitness test. You will then consider the selection of appropriate tests for specific sports performers, demonstrating your ability to conduct a range of fitness tests in accordance with safety and ethical requirements. Finally, you will evaluate and compare results to draw meaningful conclusions about a specific person's fitness.

How you will be assessed

This unit will be assessed through a series of assignments set by your tutor. Throughout this unit you will find useful assessment activities that will help you work towards your final assignments. Completing each of these assessment activities will not necessarily mean that you achieve a particular grade, but each will help you through relevant research or preparation that can be used towards your final assignments.

To ensure that you achieve all the tasks in your set assignments it is important that you cover all the Pass criteria. Make sure that you check each of these before you submit your work to your tutor.

If you are hoping to achieve a Merit or Distinction you must consider how you present the information in your assignment and make sure that you extend your responses or answers. For example, to achieve a Merit you must explain the use of specific fitness tests, outlining why these have been chosen, and further explain the results. To achieve the Distinction criteria you must further analyse the results and be able to justify the recommendations that you make for each component of fitness based on this information.

The assignments set by your tutor will consist of a number of tasks designed to meet the criteria in the table. They are likely to consist of written assignments but may also include:

- ▶ planning a series of fitness tests for multiple sports performers
- ▶ safely conducting a number of fitness tests for each component of fitness
- ▶ creating and assessing a fitness profile for a specific, selected sports performer.

Assessment criteria

This table shows what you must do in order to achieve a **Pass**, **Merit** or **Distinction** grade, and where you can find activities to help you.

Pass

Learning aim A Understand the principles of fitness testing

A.P1

Explain the importance of validity, reliability, practicality and suitability in relation to fitness testing.

Assessment practice 5.1

A.P2

Explain how ethical requirements should be met when planning and conducting fitness testing, giving examples.

Assessment practice 5.1

Learning aim B Explore fitness testing for different components of fitness

B.P3

Select six valid fitness tests for selected sports performers.

Assessment practice 5.2

B.P4

Safely administer and accurately record the results of six fitness tests for a sports performer.

Assessment practice 5.2

B.P5

Interpret fitness test results against normative data.

Assessment practice 5.2

Learning aim C Undertake evaluation and feedback of fitness tests results

C.P6

Create a fitness profile for a selected sports performer following fitness testing, providing feedback to the performer on their fitness test results and how they can impact on sporting performance.

Assessment practice 5.3

Merit**A.M1**

Recommend methods that can be used to ensure fitness testing is conducted in a valid, reliable, practical, suitable and ethical way.

Assessment practice 5.1

B.M2

Assess practicality and suitability of each selected fitness test for selected sports performers.

Assessment practice 5.2

B.M3

Administer six fitness tests, demonstrating skills to ensure the test results are accurate and reliable.

Assessment practice 5.2

B.M4

Suggest areas for improvement in the administration process of fitness tests based on test results.

Assessment practice 5.2

C.M5

Assess the strengths and areas for improvement from fitness test results providing feedback for a selected sports performer.

Assessment practice 5.3

Distinction**AB.D1**

Analyse own administration of selected fitness tests against practicality, suitability and ethical guidelines justifying suggestions for improvement.

Assessment practice 5.2

C.D2

Justify the fitness profile for a selected sports performer including identified areas for improvement related to their selected sport.

Assessment practice 5.3

C.D3

Evaluate the effectiveness of methods used to test the components of fitness and provide feedback to sports performers.

Assessment practice 5.3

Getting started

Fitness is an essential ingredient in all sport and exercise performances. Write a list of the different components of fitness and how these can affect sporting performance. Now consider a sport of your choice and describe the main components of fitness that are needed in order to be successful.



A

Understand the principles of fitness testing

Link

This unit can tie in with *Unit 2: Fitness Training and Programming for Health, Sport and Well-being*. It also links with *Unit 8: Coaching for Performance* and *Unit 28: Sports Performance Analysis*.

To safely and effectively administer laboratory-based and field-based fitness tests, you need good knowledge and understanding of tests for different components of fitness, and the procedures and protocols to follow. You need to be aware of the advantages and disadvantages of different fitness tests and their implications when selecting and administering tests.

Validity of fitness tests

Validity is essential in fitness testing because it relates to whether you are actually measuring what you planned to measure. Without validity you might use a test that does not actually measure the component of fitness you were aiming to measure. For example, if you used a sit and reach test to measure strength, your results would be invalid. Therefore it is essential that when you undertake fitness tests you understand the purpose of the test and that the results relate to the component of fitness that you set out to measure.

The test should also target an element of fitness that is relevant for the sports performer being tested. For example, it would be pointless to test a weight lifter to measure their reaction time, but appropriate to test them to measure their strength.

Reliability of fitness tests

What is reliability?

A reliable fitness test is one which, if repeated, would give the same or similar results. However, **reliability** can be claimed without results necessarily being correct. For example, if you always ask the wrong questions in research, you will always get the same wrong answers. This will mean the test is reliable because you have received the same wrong answers, even though they are not accurate ones.

In quantitative research (research that sets out to gather numbers and measurements), reliability can be one researcher conducting the same test on the same individual on a number of occasions and getting the same or similar results. Alternatively, it can be different researchers conducting the same test on the same individual and getting the same or similar results.

Key terms

Validity - the accuracy of the results. This means whether the results obtained are a true reflection of what you are actually trying to measure.

Reliability - the consistency and repeatability of the results obtained. That is, the ability to carry out the same test method and expect the same results.

There are certain factors you should take into account that can affect reliability. For example:

- ▶ errors can happen when you do not know how to use the equipment correctly
- ▶ the equipment may be poorly maintained
- ▶ the wrong type of equipment may be selected for the fitness test
- ▶ testing conditions may vary between tests (e.g. when conducting a sprint test outside, the wind speed may affect the results).

Benchmarking data

In order to compare the results of your fitness tests, benchmarking data is commonly used. This is data gathered from a number of studies that allows you to see a normal range of results, and allows you to make a judgement against the data that you have collected. Data will generally be put into a number of categories, including age and gender, which means that you will be able to compare your results with similar groups. Benchmarking data can also be used to compare your results with elite sports performers. By using benchmarking data you will be able to develop a fitness plan including target setting.

II PAUSE POINT

Do you understand the differences between 'validity' and 'reliability'?

Hint

Close the book, then write a definition of what is meant by validity and what is meant by reliability.

Extend

Consider why validity and reliability are important in fitness testing and what your results would mean if these were not considered.

Methods of ensuring reliability

To ensure that the test results are reliable there are a number of different factors that you must remember and follow in your role as an administrator.

Pre-test

- ▶ **Calibration of equipment** – before you start any fitness test you must ensure the equipment you are using is fully functional and in good working order. To do this you must check that any device used for measuring is reset and that the equipment is fit for purpose. In some cases, you may need to seek specialist help to ensure that the equipment is serviced and in good working order.
- ▶ **Warm-up** – many of the fitness tests will require strenuous exercise, and therefore it is important that subjects are fully prepared to ensure that injury does not occur. This is especially important where flexibility is being measured as well as where sudden power tests are conducted. It is also important to make sure the time spent warming up or practising is the same before each test; for example, sit and reach scores will vary depending on how much warming up or stretching has been done before the test. Tests that measure resting heart rates should be carried out before a warm-up or after the heart rate has returned to normal resting levels.
- ▶ **Fitness test technique practice** – to ensure that your test results are reliable you must make sure that the subject uses the correct technique when conducting a fitness test. It is useful to demonstrate the technique that must be used during the test and then allow the subject to practise before starting the actual test. During the practice, highlight and correct any poor techniques. Sometimes incorrect technique will be used when the subject begins to tire, so it is important to watch for this and correct if necessary.

Discussion

If the incorrect technique is used then your results may not be reliable and there is also a risk of injury. In groups, discuss what the implications of this might be and ways you can ensure your subject is using the correct techniques.

Key term

Protocol – a set method for carrying out a particular test. If you do not follow a standard protocol when conducting fitness tests, your results will not be reliable.

During the test

- ▶ **Skill level of the administrator** – the more experienced you are in administering a range of fitness tests, the more reliable the results will be. Therefore it is useful to practise each test so that you increase your skill levels as well as improve your confidence. Your own skill will also reassure your subjects during the tests.
- ▶ **Adherence to test protocol** – to ensure that the fitness test results are reliable and that these can be compared to normative data, you must always follow the standard set test protocol. If you deviate from the set methods, your results may become invalid as they are likely to be inaccurate. For example, if you undertake the multi-stage fitness test but only measure 15 metres instead of 20 metres, your test result will be inaccurate and unreliable. Protocols for specific fitness tests are described on pages 222–246.
- ▶ **Constant conditions** – the administration of fitness tests can generally be categorised into two broad areas:
 - field-based tests, which usually take place outside or where the sport or exercise usually takes place. As such, the test may be affected by factors such as the weather, the outside temperature or the condition of the testing surface (e.g. running track)
 - laboratory-based tests, which can be used to eliminate the factors that can affect field tests and to ensure that the exact same conditions are used every time you undertake the same test. However, testing indoors can be restrictive, especially where a large space is needed such as for the 60-metre sprint test.
- ▶ **Appropriate rest periods between tests** – to ensure that your subjects are able to perform in the selected fitness test, and for the results to be reliable, you must ensure that they are fully rested. This is particularly important where the subject may have practised a test or where a test involves working at a maximal level, for example, a VO_2 max test. Therefore you must ensure that your subject is fully rested before commencing any test. Further you must consider the order in which you undertake the fitness tests because some tests will require the subject to recover before starting the next test. Without recovery time built into the testing protocol, there is a risk that subsequent test results will be affected.

Practicality and suitability of fitness tests

At the centre of successful fitness testing is the ability to identify the component of fitness that is to be assessed, before selecting and administering a suitable test, and then being able to record and interpret the results. However, there are a number of additional factors that you must consider that will affect your ability to undertake a range of fitness tests.

Factors affecting the practicality of fitness tests

Cost

A significant factor when measuring fitness is the cost of the equipment. Many tests will require highly advanced laboratory equipment which is very expensive. However, a number of tests, including many of those outlined in this unit, only require basic and affordable equipment such as a stopwatch, tape measure and cones.

Time

Fitness testing can be very time consuming, especially when you are working with large groups of people such as a team. Some tests can be quick to administer while others can take much longer. Likewise, some tests, such as the sit and reach test, require you to work on a one-to-one basis while other tests, such as the multi-stage fitness test, can be administered to a large group of subjects at the same time.

It is important that you consider the test you are going to select and plan enough time to undertake it, including time to give feedback to the subject or subjects. Remember to consider the order of the tests to ensure you allow sufficient recovery time between them, especially for activities that require increases in heart rate.

Equipment

Having the correct equipment is important when measuring the components of fitness. Many tests can be conducted using basic equipment while some tests will require more advanced (and expensive) equipment. Whatever equipment you use, ensure that you are familiar with how it works, check that it is serviced or well maintained, and check that you can calibrate it if necessary. Do not undertake a fitness test using damaged equipment, as this might be dangerous and could also lead to inaccurate and unreliable results.

Some components of fitness can be measured using different tests, and in some cases the data that you obtain will be predicted results rather than actual results. An example of this is measuring aerobic capacity (VO_2 max) where the multi-stage fitness test will allow you to predict your aerobic capacity, whereas a maximal oxygen consumption test will give your actual aerobic capacity.

Facilities available

Using an appropriate facility will help to ensure that results are accurate and reliable. Always check facilities before use and identify any hazards. Likewise, having changing facilities and a rest area will help make your subjects comfortable.

Reflect

Think about the different fitness tests you have observed or participated in, perhaps through your local sports club or through another programme of study. What were the advantages and disadvantages of the tests? Think about factors like cost, time and equipment required. Write a list and discuss in pairs or small groups.

Suitability

When planning fitness testing, ensure that the tests you select are suitable for the components of fitness used in the chosen sport. Each sport requires certain attributes and relies on some factors more than others for successful performance. For example, you would not necessarily want to test a marathon runner for sprint speed – your testing time could be better spent doing more relevant tests.

Likewise you should consider the fitness levels of the performer and only undertake tests that are relevant and suitable. For example, if a performer has low levels of aerobic fitness it would not be suitable to conduct a maximal aerobic test with them.

II PAUSE POINT

What is meant by 'practicality' when considering fitness testing?

Hint

What are the factors that will affect the practicality of fitness testing?

Extend

How might you address each of these factors to ensure that your fitness tests are valid and reliable?



► Laboratory equipment used for fitness testing can be expensive

Ethical issues associated with fitness screening

Before you start any fitness testing session you must get **informed consent** from the participants (see pages 248–249). You must also **ensure the welfare of the participant** at all times when carrying out fitness tests. You can read more about the health and safety aspects of fitness testing, including reasons for terminating a test, later in this unit, starting on page 248.

Pre-test preparation

To ensure that the results you gain from a series of fitness tests are valid and reliable, you must make sure that the participant is fully prepared for the testing session.

Before the test, the participant should be fully rested and free from injury. Likewise they must be fully recovered from any previous exercise and should not have participated in exercise immediately prior to the test.

For tests such as body composition using bio impedance the participant must be fully hydrated. This is also important for tests where aerobic and muscular endurance are being measured so that the participant does not become dehydrated during the test.

For a number of tests, including flexibility and power and strength tests, a full warm-up should be conducted to reduce the possibility of injury.

Research

For more information about ethics and codes of conduct, visit the website of the Register of Exercise Professionals (REPs) at www.exerciseregister.org.

Ethical clearance for tests

Ethical practice involves setting rules to ensure appropriate behaviour is maintained at all times. Codes of ethics for fitness trainers exist to make sure that clients' welfare is always a primary concern. This means that fitness trainers are responsible for their clients' safety at all times and must maintain high professional standards.

In your role as a fitness tester you are expected to act in a professional and ethical way. You must respect the rights and dignity of the participants at all times. You are also responsible for setting and monitoring the boundaries between a working relationship and friendship with the participant, and this is particularly important when the participant is a young person.

If you are using the results of your fitness testing as part of a research project, you must gain ethical clearance from your tutor, college or school **ethics** committee. An ethics committee is a group that looks at your research proposal and decides whether it is safe and ethical and will confirm whether you can start work on your project.

Key term

Ethics – rules of conduct that should be respected at all times and which ensure that all people are treated fairly.

Data protection

As part of your pre-screening and collection of fitness test results, you will collect confidential data. Any data you collect is protected under the terms of the Data Protection Act (1998) and must be stored in a locked filing cabinet or on a password-protected computer, accessible only by you or your supervisor. It must not be disclosed to anyone else without the permission of the subject.

Case study**Protecting client privacy**

George has recently started working as a fitness testing assistant in a sports club. He has met a number of athletes and worked on a one-to-one basis, recording their personal information and performing a number of fitness tests. He has recorded this information on the appropriate forms and stored these in a locked filing cabinet.

George has recently been approached by a coach from the sports club who he has never met before. The coach is keen on looking at the test results for all the athletes.

Check your knowledge

- 1 What should George do? Why?
- 2 How will you record client information?
- 3 How will you ensure that this information remains confidential?
- 4 Where will you store the clients' information when it is not being used?

Research

Visit the government website for more information on the Data Protection Act (1998) and why it is important. To access this website go to: www.gov.uk/data-protection/the-data-protection-act

II PAUSE POINT

What is meant by ethical issues in fitness testing?

Hint

What is ethical practice?

Extend

Why is it important for a fitness tester to behave in an ethical way?

Assessment practice 5.1

A.P1 A.P2 A.M1

Your college football team would like to prepare for the new season by undertaking a series of fitness tests in order to develop a specific training plan. The football coach has asked you to prepare a presentation and supporting leaflet that explains the importance of validity, reliability, practicality and suitability of fitness testing in relation to football.

You should also include information and examples on how ethical requirements should be met when conducting fitness tests.

The last part of the presentation should recommend methods which can be used to ensure fitness testing is conducted in a valid, reliable, practical, suitable and ethical way.

Plan

- I will make sure I consider ethics and why they are important in fitness testing.
- I will define reliability, validity, practicality and suitability.

Do

- I will complete the leaflet in as much detail as possible.
- I have practised my presentation skills and asked my peers to give me advice on how I can improve.

Review

- I can explain what the task was and how I approached it.
- I will reflect on my own work and the feedback from others, and make any necessary changes to my leaflet.

