



Unit 28: Fitness Testing

Delivery guidance

Approaching the unit

This unit gives the learner a 'hands-on' practical experience of administering a range of different laboratory or field-based fitness tests and health monitoring procedures. Therefore, access to fitness testing equipment and facilities to accommodate fitness testing and health screening are essential. Learners may benefit from a site visit to a sports science laboratory at a local higher education facility or a high-performance centre. Here they could see demonstrations of current laboratory fitness testing equipment in use. Some laboratories will allow learners to take part in the laboratory fitness tests, which is an invaluable opportunity as they will be able to experience and therefore recall exactly the standardised protocols used in that test.

Learners will study the theory behind each fitness test and then experience the processes of going through test protocols and supporting participants as they complete the test. The fitness tests can be administered using learners within the class and learners from outside the class such as school/college sports teams or people who are external to the centre (providing appropriate safeguarding and health and safety measures are in place). In doing this, learners will also ensure accurate health screening procedures are in place and applied.

The results from the fitness and health monitoring tests are then used to identify strengths and areas for improvement for a participant. This information will be useful to the participant if they take part in physical activity as it will help them to determine developmental areas for that activity and wider changes around lifestyle.

Delivering the learning aims

Learning aim A

Within the sector, health monitoring and assessing fitness levels are essential skills to ensure an accurate training programme and lifestyle are in place. Learning aim A focuses on the principles and purpose of fitness testing. Validity and reliability are often confused with each other, so it is important that the differences are made very clear and practical examples of each should be provided to help to demonstrate these concepts.

These themes can be introduced by a combination of:

- formal lectures
- learner-centred learning (e.g. individual or group research based on the use of the internet and online platforms)
- small-group discussion
- completion of knowledge organisers focusing on what each term means and how it can be applied to a fitness test for a specific component of fitness.
- active experimentation with tests that can be conducted in a centre

There are numerous accessible videos on applying the test protocols to elite athletes, which are useful for engagement and bringing the test purpose alive.



They also demonstrate the skills of a person administering fitness tests and how they can ensure they are meeting the requirements of ethical procedures with participants before and during fitness testing.

Learning aim B

For this learning aim, learners should be engaged in practical activities of carrying out health monitoring tests combined with theoretical delivery of effective health screening. Following this, learners should practically administer several fitness and health monitoring tests. Where possible, learners should also experience taking part in the test itself in order to gain a full appreciation of the whole testing experience, as both a test administrator and a participant. By taking on both roles, learners will gain a better appreciation of how to support participants when they are taking part in health and fitness monitoring. During this process, validity and reliability can each be revisited and considered for each test to help learners fully understand how they relate.

Once learners have gained experience of each fitness and health monitoring test, they can begin to explore the planning process involved for both, and how to take into account the selection of appropriate procedures for a specified purpose. This could be carried out via case studies where learners have to determine which tests would be the best for each person in the case study and then demonstrate how to administer the test protocol and procedures safely.

Learning aim C

For learning aim C, the fitness and health profile for an individual from learning aim B will be further explored. Learners can use normative data tables to complete an interpretation task. This will consolidate learner understanding of the testing procedures and provide an indication of the areas of fitness and health strength and those areas that require improvement. A fitness and health profile can be explored and interpreted in small groups or the whole group to show an insight of how this looks and what information it displays.

Guest lecturers who have taken part in fitness tests to receive fitness profiles or professional fitness profilers could provide further information and real-life case studies for learners. This will help learners to fully understand the benefits of this process and the links to professional careers that use fitness testing as part of their job role. It will also provide an insight into how the data can be used to provide recommendations about lifestyle changes.



Assessment model

Learning aim	Key content areas	Recommended assessment approach
A Examine a range of laboratory-based and field-based fitness tests	A1 Fitness tests A2 Advantages and disadvantages of different tests	A presentation on different fitness tests, their application and types of data they provide for specific individuals.
B Use health screening techniques and fitness tests for a specified purpose	B1 Health screening procedures B2 Health monitoring tests B3 Fitness tests B4 Administering tests and screening	Devise and administer health screening and fitness testing that is relevant to a chosen sport. Feedback should be given to the client based on data interpretation and consultation with normative data. Recommendations for lifestyle improvement and future activities or training should be provided.
C Interpret the results of fitness tests and health screening techniques for a specified purpose	C1 Interpret results against normative data C2 Feedback	

Assessment guidance

This unit is internally assessed. There is a maximum number of two summative assignments for this unit. Tutors should refer to the assessment guidance in the specification for specific detail, particularly in relation to the requirements for Pass, Merit and Distinction grades.

It is suggested that **learning aim A** is assessed via a presentation. Within the chosen resource, the learners must address the advantages and disadvantages in relation to fitness testing. This will be completed using the key terms of reliability and validity, and wider issues concerning practicality and suitability. Learners will also need to explore the purpose of each fitness test. This includes the component of fitness being assessed, and benchmarks which an assessment can be made from, and which a programme can be written to develop that specific component of fitness.

To support learners in their report writing, they should be encouraged to use headings, subheadings and annotation such as pictures and diagrams from either the internet or their own active experimentation to support their explanations. This report will support learners in administering the fitness tests in learning aim B.

To access higher grades, learners must be able to compare the tests for a physical fitness component. This can be included in their written presentation. A case study of individual needs can be used in order for learners to access D1 and be able to evaluate the fitness tests for the fitness needs of a chosen individual. This will explore both the benefits and disadvantages of those tests.

Learning aim B will initially be the preparation of a health screening questionnaire. To access Merit and Distinction, learners should be able to justify and evaluate their design of questionnaire. B.P3, P4 and P5 require practical assessment and application. Learners will need to demonstrate that they can set up and administer six different fitness tests using protocols learnt in the previous learning aim. They will need to demonstrate that they have also devised and carried out the appropriate health screening procedure on the participant. The learner should have also discussed with the participant any pre-test procedures that need to be carried out before undertaking a test. Learners will be expected to show that they have appropriate recording equipment to take the



fitness test results and be able to record the results of each fitness test accurately. When the test is being carried out, the learner should support and guide the participant appropriately as well as demonstrate that they are following ethical guidelines for fitness testing.

Hard evidence of the practical assessment should be provided, for example learner observation records, or annotated photographs of each fitness test that was administered. For B.M3, the learner may accompany their practical application with evidence of a justification on why the six tests were selected, using their previous learning on suitability, reliability, validity and practicality.

The results recorded for the fitness tests and health screening procedures will be followed by an interpretation, taking into account normative data tables, for **learning aim C**. The learner can then choose a model of feedback to describe and discuss the findings of the results. For a higher grade, the feedback is developed by outlining strengths and areas for improvement. The normative data will be key for comparisons and allow the learner, for BC.D2, to consider activities and strategies to form part of recommendations for lifestyle improvement.



Getting started

This gives you a starting place for one way of delivering the unit, based around the recommended assessment approach in the specification.

Introduction

Introduce the unit to your learners by designing a video montage of the components of fitness required for different sports. Clips that show a sportsperson performing specific techniques and skills specific to their position or their sport can be shown, such as a footballer performing a variety of skills that require different fitness components. This can be accompanied by the health profile of this footballer to demonstrate evidence of physical health. This will enable you to engage learners with a topic that is very relevant to the sports and fitness industry. There are numerous and credible video clips of elite athletes being tested in field-based and laboratory-based fitness tests. Likewise, this will maximise engagement and show the relevance of fitness and health monitoring.

Outline to learners that the unit explores fitness testing and health monitoring through the use of practical application. They will also learn how to conduct fitness tests appropriately, taking into account health and safety, and ways to obtain reliable and valid data, as well as the suitability and practicality of each fitness test.

Explain to learners that they will be equipped with the practical skills to set up, administer and record the results of a range of laboratory-based and field-based fitness tests, as well as devising accurate health screening and monitoring, and that it will also give learners a good understanding of the interpretation of fitness test results data and the application to a specific individual in order to help to improve their lifestyle.

Learning aim A - Examine a range of laboratory-based and field-based fitness tests

- Learning aim A is about ensuring learners develop a knowledge and understanding of the standardised protocols of a range of laboratory-based and field-based fitness tests.
- For A1, introduce this learning aim by posing the question; *Why do we carry out fitness testing?* Through group and tutor discussion, learners can complete a knowledge organiser on the purpose of fitness testing. The videos suggested in the introduction will bring the array of reasons alive. It is useful to show different sports and individuals, but reach the conclusion that, on the whole, the purpose is largely generic and in line with those listed in the unit content.
- In pairs or small groups, learners are allocated a fitness test each and asked to complete a learner-led research task on the test using the following key focus areas;
 - Which fitness component is being tested?
 - Equipment required
 - Test protocol
 - Correct units of measurement
 - Normative data tables for their own age group.

The tests to be allocated are;

- Strength, 1RM and grip dynamometer
- Aerobic endurance, multi-stage fitness test and step test



- Speed, 30m sprint test
- Power, vertical jump
- Muscular endurance, one-minute sit-up and one-minute press-up test
- The tutor has ownership of the sit and reach test for flexibility to model the key areas (this can be changed for another test). When required, calibration of the equipment is emphasised as this will provide vital links with reliability in A2.
- Each group will present their findings. The tutor initially presents the sit and reach test to demonstrate the expectations and requirements of the presentation.
- The group continue to have ownership of a test and, following their presentation, are set a task to set up the fitness test with tutor support in an allocated facility. Again, the tutor models this with the sit and reach test.
- Learners have a go at a circuit of fitness tests to increase their familiarity and confidence. Active experimentation with the tests maximises both understanding and engagement. The order of tests, however, needs to be considered so that learners are not fatigued before participation in each test.
 - A suggested first circuit would be the sit and reach test, one-minute sit-ups, vertical jump, grip dynamometer.
 - Followed by another session: one-minute press-ups, sprint test and step test.
 - Finally, the multi-stage fitness test and 1RM.
 - For all of the above, learners should collate results and be asked to research normative data on each test. They will be able to informally compare their own result to this data. Warm-up routines should be consistently applied.
- Depending on confidence and experience, where possible, learners should be encouraged to work with people who are not their peers so that they can experience fitness testing on a range of people of different ages and different physical activity levels. School or college teams could be asked to participate in the fitness testing or outside local sports teams (although this would require additional safeguarding checks). This would be beneficial to do to develop confidence in administering each test after the initial introductions and practice and also support the summative assessment for learning aim B.
- The equipment required for the laboratory-based fitness tests, maximal treadmill protocol (aerobic endurance), Wingate test (power), skinfold calipers, bioelectrical impedance analysis and hydrodensitometry (body composition), may mean that these tests are not possible for practical administration or participation in some centres. Where this is the case, video footage or a visit to a sports science laboratory that contains this equipment would need to be viewed by learners so that they are aware of what these tests entail and how they are administered. A visit to such a facility would provide an excellent insight into the sports science sector and may support future aspirations with employment. (NB. Skinfold calipers are readily available, however in the first instance, due to the invasive nature of the test, it is advisable learners see the test being administered correctly and sensitively using the laboratory equipment.)
- For A2, from the observation and experimentation, learners are able to review test protocols and consider the advantages and disadvantages of each test. A tutor-led workshop of the key terms of validity and reliability and the wider issues with practicality and suitability will also be shared to support this review. The sit and reach test can continue to be the example for a gymnast or swimmer.



- Wider issues – learners work in pairs to reflect on the equipment used or observed and research the costs, time required when working with large groups, type of facility needed and the complexity and skill level of the person carrying out the test. This reflection exercise will continue to develop a familiarity with the fitness tests. It may be appropriate to again allocate a number of tests in small groups for discussion, which can then be shared with the whole group.
- For reliability, discuss pre-test procedures completed during the active experimentation and ask for what their thoughts are on their effects on the consistency of test results.
- Learners consider:
 - how a warm-up could improve or decrease fitness test results
 - pre-test procedures that should be followed by the participant (rest, hydration levels etc.)
 - the fitness testing environment (heat, cold, surface, rain, wind etc.).
- Set up a group mini presentation on validity: each group is given a test and selection of fitness tests to apply how validity would affect the fitness testing of a sports performer in a specific sport. The number of sports is to be varied to maximise understanding of the issue and diversity of validity for many sport individuals. This also avoids repetition. They present the feedback to the whole group.

Learning aim B: Use health screening techniques and fitness tests for a specified purpose

- Learning aim B is primarily about practical delivery, as learners should be able to revisit, experience and administer each of the fitness tests listed in the unit content for a specified individual and context. If they are unable to be provided with a physical participant, they can be given case studies of an individual with a specific age, gender and physical activity level. Learners then need to select appropriate fitness tests based on suitability, validity, reliability, practicality, sequence of tests and resources. Prior to fitness testing, they are required to take ownership of health screening procedures and complete the health monitoring tests.
- For B1, learners will research and find visual examples of a variety of health screening documentation and informed consent forms. Consolidate learning on both of these through allowing learners to complete and then compare. A discussion on the importance and purpose of these will then follow.
- Set up a 'mock' client consultation for learners to observe. Learners review the key skills and processes required.
- Use this discussion and review for learners to devise their own health screening documentation. The standard method is to use a questionnaire and consent form. Learners can be tasked with devising one that uses technology such as capture forms or survey products.
- For B2 and B4, learners need to be introduced to the health monitoring tests; heart rate, blood pressure, lung function, waist-to-hip ratio and body mass index (BMI).
- Led by the tutor, learners can complete pre-test procedures, observe professional conduct and fully appreciate reasons to terminate a test. Where applicable, and if informed consent is given, learners have a go at the monitoring tests and record their own results. They will access and research normative data and health ranges and interpret their own results against this.



- Learners produce posters on the test protocol and sequence of each health monitoring test.
- For **B3 and B4**, learners administer health screening and fitness tests for a chosen individual. Learners use previous learning to have sole ownership over working with this individual. Accurate test record forms need to be created and normative data researched. Learners can be supported and observed throughout the whole process of administration; however, the aim is for them to independently develop the skills, experience and confidence in selecting and administering health screening procedures and fitness tests. The fitness tests listed in B3 may not be accessible for learner ownership, so choosing six or more is advisable to match the assessment criteria.

For each test, the following learners must cover :

- preparation for the test
 - safe and effective administration of the test protocol
 - calibration of equipment
 - recording test results
 - suitability of each test using previous learning of validity, reliability and practicality.
- This can be captured by video evidence or annotated images. Client confidentiality and safeguarding measures need to be in place and checked by the tutor.

Learning aim C: Interpret the results of fitness tests and health screening techniques for a specified purpose

- Learning aim C aims to ensure that learners understand the importance of interpreting test data and conveying the messages that data suggests.
- For C1, recap normative data and health ranges and ensure learners are aware that norms can vary on age, gender, sports performers and elite athletes. A case study on BMI and elite athletes can help learners make comparisons and judgements on the relevance and usefulness of the health ranges.
- Hold a group discussion on what connections can be made between results.
- For C2, methods of feedback are shared with the learner. In small groups they can work to discuss which methods of feedback can be used, including both their strengths and weaknesses. Each group then feeds back to the rest of the class.
- Case studies - learners are given case studies of individuals and their fitness test results and health range. Learners are able to see how strengths and areas for improvement are determined and the study concludes with recommendations for ways of improving the results. Professional fitness profiles can be used as case studies.
- Learners use the data captured in B3 and B4 and choose an appropriate method of presenting this data. Results tables are created but, when comparing to norms, learners will need to work with other forms of graphical representation.
- This data is then evaluated. The comparison against normative data allows the learner to draw out strengths and areas of improvement. They conclude with lifestyle recommendations and feed back to the individual using one of the previously discussed methods.



Details of links to other BTEC units and qualifications, and to other relevant units/qualifications

This unit links to:

- Unit 1: Health, Wellbeing and Sport
- Unit 6: Exercise and Fitness Skills Development
- Unit 9: Nutrition for Physical Activity and Exercise
- Unit 15: Developing Coaching skills
- Unit 31: Influence of Technology in Sport and Physical Activity.

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC International L3 Qualifications in Sport. Check the Pearson website at: (<http://qualifications.pearson.com/endorsed-resources>) for more information as titles achieve endorsement.

Textbooks

Adams GM, *Exercise Physiology Laboratory Manual: Health and Human Performance* (Fourth Edition), McGraw Hill Higher Education, 2001 ISBN 9780072489125

Adams M et al, *BTEC Level 3 National Sport (Development, Coaching and Fitness) Student Book* (Third Edition), Pearson, 2010 ISBN 9781846906503

Allen MB, *Sports Exercise and Fitness: A Guide to Reference and Information Sources*, Libraries Unlimited Inc, 2005 ISBN 9781563088193

American College of Sports Medicine, *ACSM's Guidelines for Exercise Testing and Prescription* (Seventh Edition), Lippincott Williams and Wilkins, 2005 ISBN 9780781745901

American College of Sports Medicine, *ACSM's Health-Related Physical Fitness Assessment Manual* (Second Edition), Lippincott Williams and Wilkins, 2007 ISBN 9780781775496

Coulson M, *The Fitness Instructor's Handbook: A Complete Guide to Health and Fitness (Fitness Professionals)* (Second Revised Edition), A&C Black, 2007 ISBN 9781408178263

Franks BD and Howley ET, *Fitness Leader's Handbook* (Second Edition), Human Kinetics Europe, 1998 ISBN 9780880116541

Hazeldine R, *Fitness for Sport*, The Crowood Press, 2000 ISBN 9781861263360

Heyward VH, *Advanced Fitness Assessment and Exercise Prescription* (Fifth Edition), Human Kinetics, 2006 ISBN 9780736057325

Howley ET and Franks BD, *Health Fitness Instructor's Handbook* (Fourth Edition), Human Kinetics Europe, 2003 ISBN 9780736042109

Maud PJ and Foster C, *Physiological Assessment of Human Fitness* (Second Edition), Human Kinetics Europe, 2005 ISBN 9780736046336

Powers SK and Howley ET, *Exercise Physiology: Theory and Application to Fitness and Performance* (Sixth Edition), McGraw Hill Higher Education, 2006 ISBN 9780071107266



Sharkey BJ, *Physiology of Fitness* (Third Edition), Human Kinetics, 1990 ISBN 9780873222679

Sharkey BJ and Gaskill SE, *Fitness and Health* (Sixth Edition), Human Kinetics, 2006 ISBN 9780736056144

Skinner J, *Exercise Testing and Exercise Prescription for Special Cases: Theoretical and Clinical Applications* (Third Edition), Lippincott Williams and Wilkins, 2005 ISBN 9780781741132

Stafford-Brown J and Rea S, BTEC National for Sport and Exercise sciences
(Third Edition), Hodder Education, 2010 ISBN 9781444111989

Watson AWS, *Physical Fitness and Athletic Performance: A Guide for Students, Athletes and Coaches* (Second Edition), Longman, 1996 ISBN 9780582091108

Journal

American College of Sport Medicine's Health and Fitness Journal (Lippincott, Williams and Wilkins)

British Journal of Sports Medicine (BMJ Publishing Group Ltd)

Exercise and Sport Science Reviews (Lippincott, Williams and Wilkins)

International Journal of Sport Science and Coaching (Multi-Science Publishing)

Medicine and Science in Sports and Exercise (American College of Sports Medicine)

Research Quarterly for Exercise and Sport (Routledge)

Videos

<https://www.youtube.com/watch?v=zFeVaMFJJW4> – Mr B.

Websites

www.1st4sport.com – Coachwise

<https://www.bbc.co.uk/bitesize/guides/zw7wmnb/revision/3>

www.bases.org.uk – British Association of Sport and Exercise Sciences

www.brainmac.com – Testing protocols and normative data

www.humankinetics.com – Human Kinetics

www.sportscoachuk.org – Sports Coach UK

www.sportsci.org – Sport Science

www.topendsports.com – The Sports Fitness, Nutrition and Science Resource – provides a range of information including sport, sport medicine and sports psychology

Pearson is not responsible for the content of any external internet sites. It is essential for tutors to preview each website before using it in class so as to ensure that the URL is still accurate, relevant and appropriate. We suggest that tutors bookmark useful websites and consider enabling learners to access them through the school/college intranet.