Pearson BTEC Nationals in Sport and Exercise Science

Delivery Guide

Pearson BTEC Level 3 National Diploma in Sport and Exercise Science

Pearson BTEC Level 3 National Extended Diploma in Sport and Exercise Science

First teaching September 2017

Pearson BTEC Level 3 National Extended Certificate in Sport and Exercise Science

Pearson BTEC Level 3 National Foundation Diploma in Sport and Exercise Science

First teaching September 2018

Edexcel, BTEC and LCCI qualifications

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All information in this specification is correct at time of publication.

Welcome to your BTEC National delivery guide

This delivery guide is a companion to your BTEC Level 3 National specifications, Authorised Assignment Briefs (AABs) and Sample Assessment Materials (SAMs). It contains ideas for teaching and learning, including practical activities, realistic scenarios, ways of involving employers in delivery, ways of managing independent learning and how to approach assessments. The aim of this guide is to show how the specification content might work in practice and to inspire you to start thinking about different ways to deliver your course.

The guidance has been put together by tutors who have been close to the development of the qualifications and so understand the challenges of finding new and engaging ways to deliver a BTEC programme in the context of the new qualifications from 2017.

Guidance around what you will need to consider as you plan the delivery of the qualification(s) has been provided. You will find information around the structure of your course, how you may wish to build the course for your learners, suggestions for how you could make contact with employers and information around the other support and resources available to you.

Unit-by-unit guidance has been provided and it includes suggestions on how to approach the learning aims and unit content, as well as ideas for interesting and varied activities. You will also find coverage of assessments, including useful advice about external assessment, as well as tips and ideas around how to plan for and deliver your assignments.

You will also find a list of carefully selected resources for each unit. The list includes suggestions for books, websites and videos that you can either direct your learners to use or that you can use as a way to complement your delivery.

We hope you will find this guidance relevant and useful.

Enjoy your course!

What's new

The BTEC Level 3 Nationals 2017 are the result of more than three years' consultation with employers, higher education institutions (HEIs) and many thousands of tutors and managers in colleges and schools. Our aim has been to ensure that the BTEC Level 3 Nationals continue to allow a recognised and well-respected route into employment or higher education by meeting the needs of these key stakeholders, and that learners continue to enjoy a stimulating course of study and develop the skills and attributes that will enable them to progress.

As a result of this consultation, and on the advice of employers, higher education institutions and most importantly of those of you who teach BTEC, some key changes have been made to the BTEC Level 3 Nationals. These are described through this delivery guide and include the following.

- **Updated content and a larger proportion of mandatory content** – both employers and universities said they wanted a greater consistency in coverage of the subject for BTEC learners. Employers wanted to see systematic coverage of core knowledge and skills for their sector, and for the Nationals to reflect up-to-date industry practice.
- **The re-introduction of external assessment** – employers were keen to see an element of rigour and consistency across the country in terms of assessment, while HEIs wanted learners to be better prepared for meeting deadlines and preparing for formal examinations, where appropriate. Both were keen to see learners applying their knowledge and skills to new contexts through synoptic projects and assessments.

- **A focus on employability skills** – the BTEC approach to learning, through projects, self-directed assignments, group work and work placements, has always supported the development of employability skills, e.g. self-management. In the new Nationals, the balance of cognitive and skills work has been carefully calibrated to ensure that learners get a range of different opportunities across their course.
- **Broader assessment in internal units** – the assessment criteria for each unit are carefully structured to set a clear level of demand. Distinction criteria encourage and require depth of study, including demonstration of the application of knowledge and understanding as well as a synoptic element for the learning aim or unit.
- **Alignment with DfE criteria for performance measures for 16–19 year olds in England** – all new BTECs are designed as either Applied General qualifications or Tech Levels to fulfil criteria for inclusion in 2018 performance tables and funding for 16–19 year olds and 19+ learners.

To support transition to the BTEC Level 3 Nationals 2017, we are providing an enhanced support programme with exemplar and practice materials and training. Please see the 'Support and resources' section for details of this support, and the link to sign up for tutor training, which continues throughout the lifetime of the qualification.

Notes:

The specification tells you what must be taught and what must be assessed. This delivery guide gives suggestions about how the content could be delivered.

The suggestions given in this delivery guide link with the Authorised Assignment Briefs provided by Pearson, but they are not compulsory. They are designed to get you started and to spark your imagination.

Contents

OVERVIEW

Delivery Guides as support

In the specification, the 'Unit content' tells you what must be taught and the 'Assessment criteria' what must be assessed. The 'Essential information for assessment decisions' explains what the assessment criteria mean.

This delivery guide provides suggestions and ideas on how to plan and deliver the qualification, and includes a summary of recent changes.

Unit-by-unit guidance has been provided, which includes suggestions on how to approach the learning aims and unit content. Teaching, learning and formative assessment activities are also suggested. You will also find delivery plans to help you timetable your course and ensure your learners are well prepared for internal and external assessments.

Links to carefully selected resources are provided for each unit. The lists include suggestions for books, websites and videos that will help you plan and deliver your course. Alternatively, you may wish to direct your learners to these resources.

Use the delivery guides as model templates or an interpretation on which you can base your own plan. Every delivery guide presents each unit as an exemplar, highlighting Sport and Exercise links to motivate tutors and learners.

Changes for those teaching the new 2016 and 2017/2018 specifications

The BTEC Level 3 Nationals 2016 and 2018 contain significant changes to the previous 2010 version. These changes reflect the views and demands of Sport and Exercise teaching practitioners, those working in this sector and government bodies with oversight of the qualifications.

For those familiar with the older 2010 specification, these changes are summarised in the table below:

Change	**New 2017/2018**		**Old 2010**	
Programme Name	Sport and Exercise Science		Sport and Exercise Sciences	
Qualification Names/GLH	No equivalent		Certificate	180 GLH
	Extended Certificate	360 GLH	Subsidiary Diploma	360 GLH
	Foundation Diploma	540 GLH	90 – credit Diploma	540 GLH
	Diploma	720 GLH	Diploma	720 GLH
	Extended Diploma	1080 GLH	Extended Diploma	1080 GLH
Mandatory Units	Between 3 and 7 (all qualifications)		Between 3 and 6 (all qualifications)	
Optional Units	Choose from up to 8 depending on qualification		Choose from up to 21 depending on qualification	
Assessment	Internal through assignments and up to 4 external depending on size of qualification		Internal only through assignments	

Structure

The table below shows a summary of the structure of the Sport and Exercise Science suite of qualifications. Make sure you use the full structure available in Section 2 of the specification when planning your course:

Unit (number and title)	Unit size (GLH)	Extended Certificate (360 GLH)	Foundation Diploma (510 GLH)	Diploma (720 GLH)	Extended Diploma (1080 GLH)
1 Sport and Exercise Physiology	120			M	M
2 Functional Anatomy	90	M	M	M	M
3 Applied Sport and Exercise Psychology	120	M	M	M	M
4 Field and Laboratory-based Fitness Testing	90			M	M
5 Applied Research Methods in Sport and Exercise Science	90		M	M	M
6 Coaching for Performance and Fitness	90	M	M	M	M
7 Biomechanics in Sport and Exercise Science	60	O	O	O	O
8 Specialised Fitness Training	60	O	O	O	O
9 Research Project in Sport and Exercise Science	60		O	O	O
10 Physical Activity for Individual and Group-based Exercise	60	O	O	O	O
11 Sports Massage	60		O	O	O
12 Sociocultural Issues in Sport and Exercise	60		O	O	O
13 Nutrition for Sport and Exercise Performance	120				M
14 Technology in Sport and Exercise Science	60				O
15 Sports Injury and Assessment	60				O

Overview of the Sport and Exercise Science qualification suite

We not only appreciate the breadth of the Sport and Exercise Science sector and how specialist each of the different units included in the course can be, but also recognise that there are interdisciplinary skills all sport and exercise scientists need. This is why the BTEC National in Sport and Exercise Science suite is comprised of a combination of mandatory and optional units.

Many centres will want to deliver courses that build on the strengths of their own practitioners. Alternatively, you may want to support progression into a specific sport and exercise area such as sports therapy. It is important to recognise the flexibility of the suite to provide relevant and tailored learning experiences. There are two significant ways that the delivery of the course can be tailored to your needs. This is through the selection of optional units and the design of projects based around the units.

External units

The mandatory content provides a balance of breadth and depth ensuring that all learners have a strong basis for developing technical skills required in the sector.

Each mandatory unit aims to enhance learners' ability to manage the rigour and experiences they will have at stages in their Sport and Exercise Science career.

Each external assessment for a BTEC National is linked to a specific unit. All of the units developed for external assessment are either 90 or 120 GLH to allow learners to demonstrate breadth and depth of achievement. Each assessment is taken under specified conditions, then marked by Pearson and a grade awarded.

On the two-year Extended Diploma, four externally set units will need to be taken. It is possible to spread these out over two years and have two sat in the first year and the remaining two in the second and still make the most of re-sit opportunities if required.

Unit 1 aims to cement the knowledge of the body systems and how they work individually and together to respond to sport and exercise and also work together to allow a person to take part in physical activity as well as adapt to specific environments and climates.

Preparation for Unit 2 should start before Unit 1 as there is some content in Unit 2 that provides underpinning knowledge for Unit 1, such as the anatomy of the different body systems, which will help to support understanding of the physiology and response to exercise in Unit 1.

Unit 3 is a very good opportunity for learners to become more independent in their assessment process. This unit gives learners the opportunity to investigate sport psychology from a specific sportsperson's perspective using a case study approach.

The purpose of Unit 13 is to ensure learners are aware of what a balanced diet should consist of in order to help support athletic performance and how this can be adapted for elite athletes in order to prepare for competition as well as during competition. This will help to support learners with their own dietary plans to improve performance as well as prepare for working as a sport and exercise scientist.

Mandatory units

Within the Applied General qualifications, there is potential to tailor the delivery structure and timing of the other mandatory units to suit the Centre needs and to maximise the learning experience. In a similar way to the external unit delivery, it will be beneficial to combine the delivery with similar optional units or to undertake them at an appropriate time:

Unit 4: Field- and Laboratory-based Fitness Testing (90 GLH)	
Timing within Extended Diploma: As a unit that has skills that underpin testing skills, it may be more relevant to deliver this within the first year	**Combination and delivery:** • Could form early part of curriculum to develop underpinning skills • Opportunities to connect this unit to *Unit 5: Applied Research Methods in Sport and Exercise Science* to provide data to analyse that will help to engage and focus learners on their own data • Easily combined with *Unit 8: Specialised Fitness Training* to help to see if fitness training is providing any adaptations and improvements in fitness test results

Unit 6: Coaching for Performance and Fitness (90 GLH)	
Timing within Extended Diploma: As a unit that has skills that underpin coaching, it may be more relevant to deliver this within the second year of the course	**Combination and delivery:** • Could be combined or delivered before *Unit 10: Physical Activity for Individual and Group-based Exercise* to help to deliver planning and leadership skills • May be better placed in the second year of the course as learners will have matured and gained confidence to assume the role of a coach

Making the right choice for your learners

The suite of qualifications is meant to be inclusive and supportive of individuals in their progression. The prior achievement and aspirations of learners are key to advising the most appropriate study programme.

It is anticipated that most learners taking these Sport and Exercise Science qualifications will plan to progress onto higher education (HE) and as such, these qualifications ensure that learners will have the skills to cope with the required academic and independent learning.

Below are some examples of learners' potential progression routes:

16 year old learner choice		
Progression intention	**Prior achievement**	**Potential BTEC National route**
Sport and Exercise Science subject in HE	5 GCSEs C or above with Maths and English	**BTEC Extended Diploma**
Sport and Exercise Science subject in HE, but uncertain of course	5 GCSEs C or above with Maths and English	**BTEC Diploma** (with an A Level, e.g. Biology, Psychology, Chemistry)

19+ Student choice		
Progression	**Prior achievement**	**Potential BTEC National route**
Sport and Exercise Science subject in HE	No experience in Sport and Exercise Science but with 5 GCSEs C or above including Maths and English	**BTEC Foundation Diploma** (with one or two A Levels or Extended Diploma)
Sport and Exercise Science subject in HE	Some experience in Sport and Exercise Science, such as GCSE PE with 5 GCSEs C or above including Maths and English	**BTEC Extended Diploma**

Making contact with employers

Employer contact is one of the most cherished experiences BTEC National learners can have, by ensuring realistic and valuable learning. Partnerships between companies and centres can often build an annual collaboration that reduces bureaucracy and eases any preparation. Here are some ideas that may support centres expanding their employer engagement:

- For guest speakers and visits, contact a local freelance or sole trader, e.g. fitness instructor, sports nutritionist, coaches and activity leaders.
- Contact small local companies directly and suggest how they may be able to support your learners through experiences, including coaching sessions, fitness testing and visits.

- Connect with other staff within own centre who may provide opportunities for visits and guest speakers, e.g. Gym Instructor, Coach.

- For work experience and placements, contact the local education business partnership.
- For live projects, real projects and competitions, approach a large local employer through their human resources department.
- For sponsorship of facilities and equipment along with collaboration, approach medium-size companies.

- Contact local charities who are often keen for volunteers from learners to help to support their cause such as carrying out sports massage before or after a charity race.
- Connect with sports centres and gyms that may often have staff who can give tours of the facility and have opportunities for work experience.
- Work with sports development officers need to attract attention to particular events or activities.

- For support in teaching and case studies and question and answer, contact previous students who have moved into industry and started their careers.

Employability skills

Employers look not only for technical skills, but also employability skills. These include:

- **Self-management:** readiness to accept responsibility, flexibility, time management, readiness to improve own performance
- **Teamworking:** respecting others, cooperating, negotiating/persuading, contributing to discussions
- **Business and customer awareness:** basic understanding of the key drivers for business success and the need to provide customer satisfaction
- **Problem solving:** analysing facts and circumstances and applying creative thinking to develop appropriate solutions
- **Communication and literacy:** application of literacy, ability to produce clear, structured written work, and oral literacy (including listening and questioning)
- **Application of numeracy:** manipulation of numbers, general mathematical awareness and its application in practical contexts
- **Application of information technology:** basic IT skills including familiarity with word-processing, spreadsheets, file management and use of internet search engines.

SUPPORT AND RESOURCES

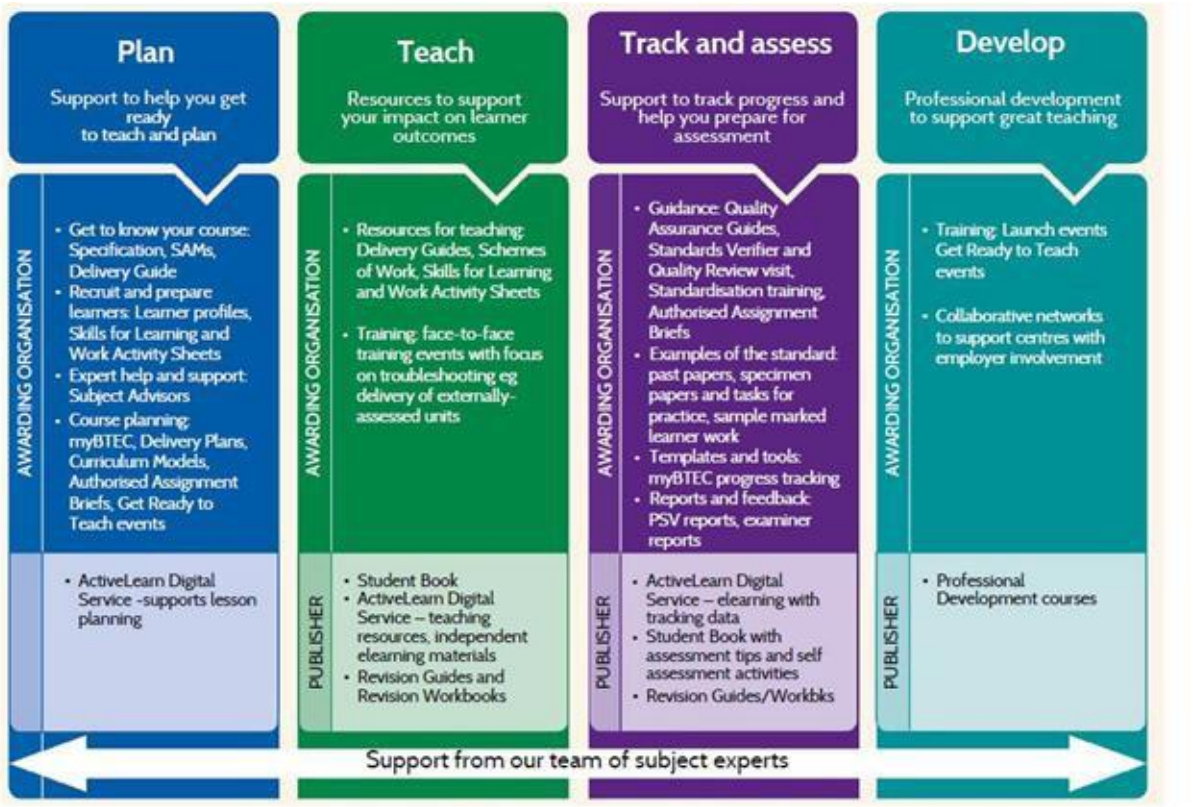
There are a wealth of resources available to ensure you feel confident in delivering your BTEC National qualification throughout your entire course.

All the 'Awarding Organisation' resources can be found on the Pearson Qualifications website here:

http://qualifications.pearson.com/en/qualifications/btec-nationals/sport-and-exercise-sciences-2016.html

As well as the free resources supporting the qualification, provided by Pearson as an Awarding Organisation, Pearson Learning Services ('Publisher' in the tables below) provides a range of engaging resources to support BTEC Level 3 Nationals, including:

- Student books in e-book and print formats
- Revision guides and revision workbooks in e-book and print formats
- Teaching and assessment packs, including e-learning materials via the Active Learn Digital Service.



In addition to the 'publisher' resources listed above, publishers other than Pearson may produce textbooks that are endorsed for BTEC. Check the Pearson website (http://qualifications.pearson.com/en/support/published-resources.html) for more information as titles achieve endorsement.

There are also a number of people who are available for you to speak to:

- **Standards Verifiers** – they are subject specialists who can support you with ensuring that your assessment plan is fit for purpose and whose role is to confirm that you are assessing your learners to national standards as outlined in the specification by providing quality assurance through sampling.
- **Curriculum Development Managers (CDMs)** – they are regionally based and have a full overview of the BTEC qualifications and of the support and resources that Pearson provides. CDMs often run network events.
- **Customer Services** – the 'Support for You' section of our website gives the different ways in which you can contact us for general queries. For specific queries, our service operators can direct you to the relevant person or department.

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Training for the new BTEC Level 3 Nationals can be found on the Pearson website here: http://qualifications.pearson.com/en/support/training-from-pearson-uk.html

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For information about Edexcel, BTEC or LCCI qualifications, visit qualifications.pearson.com

Unit 1: Sport and Exercise Physiology

Delivery guidance

Approaching the unit

This unit gives the learners an opportunity to develop an understanding of the physiology of each of the different body systems including the skeletal, muscular, cardiovascular, respiratory, neural, endocrine and energy systems. As an integral aspect of studying sport and exercise sciences, this unit will allow learners to not only support people in the sport and exercise science sector, but also give them transferable skills for many vocational jobs. This unit involves a variety of concepts that will build on subjects that have been studied at level 2 such as BTEC Sport, GCSE, PE and GCSE Science. Due to the scientific nature of the unit, it is important that the theoretical content is delivered via a variety of methods including presentations, debates, discussions, posters and role plays as well as via practicals demonstrating and experiencing exercise physiology in action wherever possible.

As this unit is assessed via an external examination, practice tests, quizzes, revision sessions and independent study can be a huge benefit to supporting your learners in achieving success. Reinforcing learning will be extremely important and this should be embedded at all points throughout the delivery of the unit content.

Delivering the topics

Topic A

Topic A focuses on the response of each body system to a single sport or exercise session. Learners could be engaged in practical activities combined with theoretical delivery. It is imperative that learners get to grips with this content as it provides the underpinning knowledge to the rest of this unit and as such, aspects of this content will be referred to throughout the unit and form an important base for the analysis section of the paper. Tutor-led delivery will be important to further support theoretical understanding in this area. Teaching could use a combination of formal lecturers and pair activities as well as whole group discussions and peer teaching. Practical application is encouraged where possible, and learners could participate in an exercise session and gather physiological data to find out how each body system is responding to exercise. Learning can be reinforced by completion of examination-style questions and independent study, giving learners an opportunity to take ownership of their study and create useful revisions tools before the examination.

Topic B

For Topic B, peer learning could be used, including snowball learning to develop peer understanding of the concept of fatigue and how it happens. Independent learning, alongside classroom discussions, provides a basis for learners to develop their research, communication and critical thinking skills. To help learners develop their knowledge of fatigue, they could use practical activities to experience fatigue and how it affects each body system. Some body systems will much more readily demonstrate the effects of fatigue, such as EPOC (excess

post-exercise oxygen consumption) and DOMS (delayed onset of muscle soreness), whereas others can only be learned from theoretical teaching, such as the replacement of calcium in bones.

This topic can be reinforced by using mix and match key term tasks as well as regular plenaries and checks for learning. On-the-spot quizzes during lessons, supplemented alongside regular oral questioning, should be encouraged to help strengthen learners' understanding. Using revision sessions is important to prepare learners for the examination.

Topic C

Topic C focuses on the adaptations of the body systems to exercise. This topic could be combined with other units in the specification related to fitness training and testing. This will allow learners to explore how their body adapts to training. Some learners in the class may have taken part in strength-related training programmes in which the majority of the adaptation is in the muscular system, whereas learners who have taken part in aerobic training programmes would experience adaptation primarily in the cardiovascular and respiratory systems. These experiences allow for peer learning and investigations into the effects of specific training on the body systems.

Where adaptation cannot be explored practically, group, pair and individual tasks could be set and information gathered to encourage peer learning/teaching and the consolidation of knowledge.

The use of videos should be incorporated as a visual aid in demonstrating the adaptations of the endocrine system, nervous system and energy systems so that learners can see the changes that occur as a result of training.

To help support preparation for the external assessment, quizzes and examination-revision style questions would help to prepare the learners for the examination.

Topic D

For Topic D, environmental factors and how they affect sport and exercise performance is explored. This can be achieved via a combination of methods including learner-centred learning, formal lectures, pair and group research and presentations, independent study and peer teaching. Learners can be given the opportunity to research topics independently, before working together to feed back to the rest of the group in engaging and creative ways.

Learning can be reinforced with the use of class discussions, completion of worksheets and practice examination questions. These, supplemented with video clips, can work extremely well in embedding knowledge. This topic area also lends itself well to an external visit to a sports science laboratory that specialises in adaptations to environmental stresses, to gain further insight from industry professionals.

Assessment guidance

This unit is assessed via examination. The examination is for one hour and 30 minutes in length and for a total of 70 marks. The paper will contain a number of short- and long-answer questions that will assess learners' understanding of the topics:

- body systems and how they respond and adapt to exercise in different environments

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- body systems and how they respond and adapt to exercise in different environments in context
- analysis of sports performance data to interpret the body's responses and adaptations to exercise and evaluate their impact on sport and exercise performance
- making connections between how the body systems work together in response to the demands of sport and exercise and to enhance performance.

This unit provides the key knowledge required, which will be developed and applied through other units. Therefore, when you are planning and delivering your units, think about how you can bring out examples that would be useful illustrations of issues covered in other units. The examination has a combination of low, medium and higher order learning questions to stretch and challenge learners at all levels.

Appropriate revision techniques include learner-centred creation of cue cards and spider diagrams, while tutors are encouraged to incorporate past papers and questions from the Sample Assessment Materials for this unit. In order to prepare fully for the demands of this examination, learners will be required to study and revise outside of lessons.

Lead Examiner reports should also be used to help inform the tutors of areas in the specification that learners are comfortable with during the external assessment, as well as key areas of content that learners find challenging. Exemplar responses are also contained in these reports to support teaching, revision and exam technique for this unit.

Getting started

This provides you with a starting place for one way of delivering the unit. Activities are provided in preparation for the external assessment.

Unit 1: Sport and Exercise Physiology

Introduction

Introduce the unit with a series of activities on exercise physiology, the body systems and how the body works. Small groups can work together to share knowledge, creating a think tank and feeding back to the rest of the group. A class discussion can result from this, enabling you to engage learners and to assess previous learning in a fun way. Outline to learners that the unit explores common themes regarding understanding of body systems and interrelationships in order to perform and carry out different types of sport and exercise movements.

Differentiation is essential during the delivery process; understanding and knowing your learners will enable you to do this effectively. For example, ensure that groups are of mixed abilities to provide peer support as well as stretching more able learners. Learners will need to understand the assessment criteria command verbs fully. This can be developed by questioning learners appropriately and through independent research.

It is important to use a range of teaching methods in order to give learners ownership of their learning.

Topic A – Responses of the body systems to a single sport or exercise session

- Introduce the topic and content regarding the different body systems.
- Learners could take part practically in a number of single sport and exercise sessions and take physiological readings including:
    - core temperature
    - skin temperature
    - breathing rate
    - tidal volume
    - heart rate (before, during and after exercise)
    - blood pressure.

  They can then use these readings to investigate how body systems respond to exercise.
- Use formal delivery for body systems' responses that cannot be measured, using a range of teaching methods to maintain learner-led learning. Use video clips and photos where possible. Learners can peer teach, where possible, to aid ownership of learning through discussions, research tasks and demonstrations.
- Consolidate individual learner's understanding by producing quizzes for the learner and directed questions and answers.

Topic B – Fatigue and how the body recovers from exercise

- Introduce Topic B with a class discussion and tutor-directed questions.
- Recap activities at the start of all lessons to check for understanding and retention of knowledge.

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- Learners could take part practically in a number of single sport and exercise sessions and take physiological readings once the exercise has stopped due to fatigue. Physiological readings can include recovery time of breathing rate and heart rate.
- Learners can also take part in a weight-training session and then experience DOMS. They can also take part in an isometric exercise, such as the ski squat, to experience lactate accumulation and its effects on the body.
- Follow up with a class discussion on how the body has responded to the exercise and recovery processes.
- Use formal delivery for the recovery of the musculoskeletal system, with a class discussion on their experience of DOMS in relation to what is happening to their muscles during this timeframe.
- Learners should research overtraining. You could give them journal articles and/or articles (from credible sources) and allocate one aspect/component of overtraining to research. On completion, learners could use the snowball method of passing on information by working in pairs, small groups and as a class to discuss their findings.
- Ask learners to create a picture board explaining overtraining and present this to the rest of the group.
- Consolidate individual learner's understanding by producing quizzes for the learner.
- Finish with a revision session and an examination practice session.

Topic C – Adaptations of the body systems to exercise

- Introduce Topic C to learners.
- Learners could take part in a training programme at the start of this unit and test how well the programme is progressing by taking fitness tests, linking with work in other units. Where possible, learners should participate in either aerobic or resistance-based training. They can then analyse fitness test results to investigate adaptations of their body systems to each method of training.
- Use formal teaching for bone remodelling and the effects on the skeletal system, linked to the methods of training required to produce this adaptation.
- Using journal articles and/or articles (from credible sources), give learners one aspect/component of adaptation of the muscular system to research. On completion of their research, working in pairs, small groups and as a class, ask them to use the snowball method of sharing their information.
- Use formal delivery to teach lung volumes, using lung volumes of trained athletes to analyse and discuss.
- Introduce adaptation of the cardiovascular system. Learners should work individually, or in pairs, to create an information poster about adaptation of the cardiovascular system. You and the rest of the class should judge the posters on content and creativity and learner's delivery to the whole class.
- Use worksheets, video footage and independent research to gather information about the endocrine system and energy systems. Follow up with a class discussion to share information.
- Use practical sessions to deliver measurement of body systems. Where possible, learners could visit an institution with the equipment required to perform each of the tests listed in the specification. If this is not possible, they could watch video footage of each test protocol being administered.
- Finish with a revision session. Set questions for learners on Topic C. Groups could

form a 'think tank' of potential areas that the questions could cover and then share ideas with other groups to attempt to answer.

Topic D – Environmental factors and sport and exercise performance

- Introduce Topic D by using video clips and photographs, where possible, of athletes exercising at high altitude, e.g., climbers ascending Everest and the effect this has on their body.
- Give learners access to supplementary articles, books and websites. Ask them to work in groups to complete a worksheet that covers responses of the body systems to high altitude and the adaptations the body makes. It is possible to use e-learning here.
- Use a practical investigation for learners to take part in a fitness test, such as the multi-stage fitness test, in normal conditions and then in warmer conditions and then compare the results. Ask the test administrators to record the perceived exertion of the person taking the test at set points in the test period, as well as their overall appearance. Lead a class discussion about how heat affected their performance.
- Formally introduce the topic area of exercising in the cold, followed by learner-led 'marketplace' learning. Marketplace learning requires your learners to carry out research, using textbooks, to become an 'expert in the field'. In the structure of a marketplace, learners walk among the different 'stalls' to share learning and content.
- To consolidate learning, arrange a visit to a sports science centre that investigates environmental factors and sports performance.
- Learners sit a mock paper and receive feedback to identify areas to work on before the examination. Follow up by going through the mock paper with the whole class.

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

This is a mandatory unit and underpins knowledge throughout the qualification.

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Sport and Exercise Sciences. Check the Pearson website (http://qualifications.pearson.com/en/support/published-resources.html) for more information as titles achieve endorsement.

Textbooks

The following textbooks are specific to the Qualifications and Credit Framework (QCF) specifications and it is anticipated that more up-to-date textbooks will be available for this National Qualification Framework (NQF) specification.

Adams M et al, *BTEC Level 3 National Sport and Exercise Sciences – Student Book*, Pearson, 2016 ISBN 9781292133959

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

Palastanga N, Field D and Soames R, *Anatomy and Human Movement: Structure and Function* (Fifth Edition), Butterworth-Heinemann, 2006 ISBN 9780750688147

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

Stafford-Brown J *et al*, *BTEC Level 3 National Sport and Exercise Sciences* (Fourth Edition), Hodder Education, 2016 ISBN 9781471878633

Tortora GJ and Derrickson BH, *Principles of Anatomy and Physiology* (12th Edition), John Wiley & Sons, 2008 ISBN 9780470233474

Journals

The following journals provide up-to-date research materials on exercise physiology.

American College of Sports Medicine's Health and Fitness Journal

British Journal of Sports Medicine

Exercise and Sport Sciences Reviews

International Journal of Sports Science & Coaching

Medicine and Science in Sports and Exercise

Research Quarterly for Exercise and Sport

Websites

These websites contain exercise physiology based content to help to support learning in this field.

www.1st4sport.com – Coachwise – an online shop for sports coaching, training and physical education books and resources.

www.acsm.org – American College of Sports Medicine

www.bases.org.uk – The British Association of Sport and Exercise Sciences (BASES) is the professional body for sport and exercise sciences.

www.humankinetics.com – The Human Kinetics website provides access to journals, educational resources and continuing education materials.

www.sportsci.org – Sport Science is a peer reviewed journal and site for sport research.

www.sportscoachuk.org – Sports Coach UK is a charity that provides information and resources about sports coaching.

www.topendsports.com – Topend Sports provides a wide range of information about sports, science and fitness

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Unit 2: Functional Anatomy

Delivery guidance

Approaching the unit

This unit gives learners the opportunity to develop an understanding of the anatomy and function of the cardiovascular, respiratory, skeletal and muscular systems. The interrelationship between the skeletal system and muscular systems are studied in depth in relation to how they work together to produce movement for sport and exercise. This will allow learners to support people in sport and exercise, and to develop skills that will be useful in many vocational jobs. This unit involves a variety of concepts that will be new to some learners. With this in mind, it is important that theoretical content is delivered using a variety of methods, including presentations, debates, discussions, posters and role plays, as well as practical sessions to demonstrate functional anatomy in action.

As this unit is assessed through an external examination, practice tests, quizzes, revision sessions and independent study can be of huge benefit in supporting your learners to achieve success. Reinforcement of key learning points will be extremely important and should be embedded at all points throughout the delivery of the unit content.

Delivering the topics

Topic A

Topic A focuses on the anatomical positions, terms and references that are key to understanding functional anatomy. It is imperative that learners get to grips with this content, as it will be referred to throughout the unit and forms an important base for the analysis section of the examination. Tutor-led delivery will be important to support theoretical understanding in this area. Teaching methods may include combination of formal lectures, pair activities, whole-group discussions and peer teaching. Practical application of new concepts is encouraged, where possible, and can work well for anatomical reference point identification. Learning can be reinforced through watching video recordings and completing examination-style questions. Independent study is also important, to give learners the opportunity to take ownership of their learning and to create useful revision tools before the examination.

Topic B

For Topic B, peer learning should be used to cover the anatomy of the cardiovascular system. Methods including 'snowball learning' can develop peer understanding and learner engagement, and work well when delivering knowledge of components of blood. Independent learning, alongside classroom debates, gives a basis for learners to develop their research, communication and critical thinking skills. Practical activities will also help learners to develop their knowledge of the cardiorespiratory system. If you have access to specialist equipment, for example, a sphygmomanometer or a digital monitor, you can teach learners how to take and analyse blood pressure readings in an engaging manner.

Learning can be reinforced with mix and match key term tasks, alongside

regular plenaries and checks that learning has taken place. On-the-spot quizzes during lessons, supplemented by regular oral questioning, are encouraged to help strengthen learner understanding. It is important to use examination revision sessions to prepare learners for the examination.

Topic C

Topic C focuses on the anatomy of the respiratory system, and can be explored through a combined tutor-led and learner-centred approach. Group, pair and individual tasks can be set and information can be gathered to encourage peer learning/teaching and the consolidation of knowledge. Group tasks could use 'ABC learning', where each learner is given a letter (A, B or C) to represent one of the key functions of the respiratory system. Learners must work independently to research this key function, before working with other learners who have studied the same function to present feedback to the rest of the group.

Videos can be used to demonstrate the respiratory system in action, supplemented with practical sessions and quizzes, where possible. If you have access to equipment for measuring respiratory function, such as a spirometer or peak flow meter, it is recommended that you use this to give learners hands-on practical experience of the mechanics of breathing.

Topic D

In Topic D, the anatomy of the skeletal system is explored. This can be achieved using a combination of methods, focusing largely on a learner-centred approach. Teaching methods may include a mixture of formal lectures, pair and group research and presentations, as well as role plays, independent study and peer teaching. Methods including 'marketplace' learning, 'speed teaching' and 'jigsaw learning' will enable learners to take ownership of their learning, particularly when studying joints, bone growth and remodelling, and the function of the skeletal system. Essentially, these methods allow learners to research topics independently, before working together to feed back their findings to the rest of the group in engaging and creative ways.

Learning can be reinforced through class discussions, completion of worksheets and use of practice examination questions, supplemented with video clips. This topic area also lends itself well to an external visit to a human biology museum or local university to gain further insight from industry professionals.

Topic E

For Topic E, learners should be engaged in practical activities wherever possible, to reinforce the delivery of information about the major muscles, the neuromuscular process of muscle contraction, antagonistic muscle pairs, fibre types, planes and types of movement. The use of guest lecturers is encouraged, to give first-hand examples of the importance of functional anatomy; personal trainers and/or sports performance analysts are ideal candidates. This should be supplemented with worksheets and a follow-up, formally taught session to check learners' understanding.

On-the-spot quizzes during lessons, to check understanding, are encouraged, and it is essential to check learning regularly. Your learners may benefit from a competitive element here, for example, games that mirror shows such as *A Question of Sport* or *The Million Pound Drop*. Group work can supplement learning in this subject area, with independent study giving learners an opportunity to take ownership of their study and to create useful revision tools before the examination. Use videos as a visual aid when demonstrating the muscular system in action, with regular recaps, plenaries and examination-style questions to support teaching and learning.

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Topic F

Topic F focuses on phases of sport and exercise movement, and the interrelationship of the muscular and skeletal systems in movement analysis. It is essential that tutors embed the interrelationships between body systems during all taught aspects of the module so that learners make connections and have the tools needed to meet the requirements of the examination. Just under 40 per cent of the external assessment focuses on movement analysis so tutors must stretch learners to analyse performance and functional anatomy in the main phases of movement from preparation to execution.

Use of online e-learning tools, such as Coach's Eye and Dartfish, can engage learners and allow them to analyse movement in greater depth; this is to be encouraged, where possible. It is important that phases of movement are studied in depth, with extended questions given to learners as practice before the examination. Revision sessions are important to allow learners to take ownership of their examination preparation, while enabling them to ask questions and seek further help if necessary. Tutors are advised to set a mock paper, with ample time to reflect on and recap results before the full examination.

Assessment guidance

This unit is assessed by examination. The duration of examination is one hour and 30 minutes, and it is of 60 marks. The paper will contain a number of short- and long-answer questions that assess learners' understanding of:

- anatomical positions, terms and references
- anatomy of the cardiovascular system
- anatomy of the respiratory system
- anatomy of the skeletal system
- anatomy of the muscular system
- analysis of the skeletal and muscular systems and how they produce movements in sport and exercise.

This unit gives required core knowledge, which will be developed and applied in other units throughout the course. Therefore, when you are planning and delivering your teaching, think about how you can provide/get learners to give examples that will illustrate issues covered in other units.

The examination has a combination of low, medium and higher order learning questions to stretch and challenge learners at all levels. The paper starts with short response questions leading up to extended response questions towards the end of the paper.

Appropriate revision techniques include learner-centred creation of cue cards and spider diagrams, and tutors are encouraged to incorporate past papers and questions from the Sample Assessment Materials for this unit. In order to prepare fully for the demands of the examination, learners will need to study and revise outside lessons.

Lead Examiner reports should also be used to help inform the tutors areas in the specification that learners are comfortable with during the external assessment as well as key areas of content that learners find challenging. Exemplar responses are also contained in these reports to support teaching, revision and exam technique for this unit.

Getting started

This provides you with a starting place for one way of delivering the unit. Activities are provided in preparation for the external assessment.

Unit 2: Functional Anatomy

Introduction

You can introduce this unit to your learners through a series of activities on functional anatomy, body systems and how the body works. Learners can work together in small groups to share knowledge and feed back their findings to the rest of the group. If this leads on to a class discussion, you will be able to engage learners and assess previous learning in a fun way. Explain to learners that the unit explores the body systems, and the interrelationships between them, in order to enable learners to perform and carry out different types of sport and exercise movement. Inform learners that they will be equipped with the skills to apply anatomical knowledge to other units, and to future educational and/or employment opportunities.

Differentiation is essential during delivery; you will need to understand and know your learners in order to do this effectively. For example, you should ensure that groups include learners of varying abilities, and plan tasks so that they will allow all learners to achieve the key topics, while also stretching more able learners. Consider the Bloom's taxonomy verbs, such as describe, explain, assess and analyse, and tailor your level of questioning appropriately with each learner. During peer review, encourage problem solving in addition to the evaluation and review process. Use a range of teaching methods, to give learners ownership of their learning.

Topic A – Anatomical positions, terms and references

- Introduce the topic and content for anatomical positions, terms and references. Learners then take part in an activity to locate different reference points of human anatomy. You could structure this activity as a competition.
- Formally deliver anatomical language, using a range of teaching methods to maintain learner-led learning. Use video clips and photographs, where possible, and encourage peer teaching – including discussions, research tasks and demonstrations – to aid ownership of learning.
- Consolidate individual learner understanding by producing quizzes for learners and using directed Q&A.

Topic B – Anatomy of the cardiovascular system

Introduce Topic B by asking learners to label the structures of the heart; follow up with a class discussion and tutor-directed questions.

- Recap previous activities at the start of all lessons to check understanding and retention of knowledge.
- Formally deliver location, anatomy and functions of cardiovascular components. Show short video clips to reinforce learners' knowledge and understanding.
- Learners research the location and anatomy of blood vessels and create a poem/rap/rhyme to demonstrate their interrelationship and importance within functional anatomy. (You could introduce a competitive element here.)
- Give learners journal articles and/or other articles (from credible sources) and ask them to research one aspect/component of blood. On completion, use the 'snowball method' to consolidate this learning: ask learners to work initially in pairs, then in small groups and ultimately as a whole class to discuss their findings.

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Unit 2: Functional Anatomy

- Lead a classroom debate about the functions of the cardiovascular system, following group and individual research.
- Practical application: cardiac cycle, blood flow through the heart, and systole and diastole. Use a digital blood pressure monitor to measure systole and diastole. (Where possible, learners should be taught to use a sphygmomanometer, as this will give a more accurate reading of blood pressure.) This will engage learners, aiding and embedding learning.
- Independent study: learners work independently to develop subject knowledge within this topic. They should produce handouts, posters, presentations and resources that can be used as tools to aid revision for the examination.
- Learners create a picture board that explains the location and function of respiratory components, and share this with the rest of the group.
- Consolidate individual learner understanding by producing quizzes for learners.
- Revision session and examination practice session.

Topic C – Anatomy of the respiratory system

- Introduce Topic C, the structures of the respiratory system. Learners label the structures of the respiratory system, using a jigsaw puzzle as a learning aid.
- Use 'ABC learning' to introduce the functions of the respiratory system. Assign a letter – A, B or C – to each key function of the respiratory system. Give each learner a letter (A, B or C) and ask them to complete independent research about the corresponding function to create an information booklet. Then, learners with the same letter should work together to teach the rest of the class about the function they have studied.
- Use examination-style questions to check learning. Recap Topics C2 'Function of the respiratory system' and C3 'Control of breathing', using creative tasks and activities, including bingo format.
- Introduce control of breathing. Learners work individually, or in pairs, to create an informative poster about control of breathing. You should judge posters on their content, creativity and delivery of information to the class. Suggestion: learners use neurons firing as a means to create a spider diagram-style poster.
- Practical application: apply functions of the respiratory system to sport to bring the theory to life.
- Examination session. Suggestion: set questions for section A, in line with previously taught content. Then put learners in groups and give each group an aspect of performance (preparation, execution or recovery) to analyse, in line with section B. Groups should form a thinktank to consider potential areas that the question could cover and begin to break down the answer. Following this, learners attempt to answer an analysis question individually.

Topic D – Anatomy of the skeletal system

- Introduce Topic D using a mix and match key terms task about the anatomy of bone. Follow this with formal teaching, using video clips and photographs where possible.
- Learner-led task: divide the class into pairs or small groups and ask them to create a game, quiz, poem, rap or role play to demonstrate bony landmarks.
- Formally teach the process of bone growth and remodelling.
- Learner-led 'speed teaching': divide the class into small groups or pairs and give

Unit 2: Functional Anatomy

each group/pair a content area and time to research it. Groups then rotate, following the format of speed dating, to teach each other about their new area of expertise. During this activity, individuals collate a workbook of content and score each other's teaching.

- Class discussion: 'What are the different types of bones?' Learners compete to label as many bones as possible, in a given time, on a volunteer in the group. (Suggestion: use sticky notes for labels.)
- Formally introduce the topic area of joints. Follow this with a learner-led 'marketplace' learning activity. Marketplace learning: individual learners research different topics, using worksheets etc to become 'expert' in a given area. Then, in the style of a marketplace, learners walk among the different 'stalls' to share knowledge and content.
- Practical application: the range of movement at joints. Make this activity interactive and learner-led, and check learning by using worksheets and Q&A.
- Independent study. Learners work independently to develop their knowledge of an area within this topic. They should produce handouts, posters, presentations and other resources that they can use as tools to aid revision for the examination.
- Deliver functions of the skeletal system using a 'jigsaw learning' method. 'Jigsaw learning': give each learner a workbook and one key function to study. Then put learners in groups so that they can teach each other to complete the 'jigsaw of learning'.
- University trip: if possible, visit a local university to investigate sports science in action within a laboratory setting. Follow up with a lecture by an industry expert and a tutor-led recap session.
- Consolidate individual understanding by producing quizzes for learners.

Topic E – Anatomy of the muscular system

- Introduce Topic E by asking learners to work in groups to complete a worksheet on one type of muscle, using supplementary articles, books and websites. E-learning, using an iPad or similar device, is possible here.
- Formally teach cardiac, skeletal and smooth muscles.
    - Independent study task: give each learner a famous athlete to study, e.g., a 100 m sprinter, a 400 m runner or a marathon runner. Learners must research their athlete alongside the skeletal muscle fibre types, explaining fibre type makeup for their athlete.
    - Next, place learners in small groups and ask them to 'teach' the rest of the group about their research. Finally, learners should work together in their groups to create posters to explain their findings.
- Formally deliver the neuromuscular process of muscle contraction and the sliding filament theory. This is best done visually, using video clips and photographs. Ask groups to devise a strategy to remember the components of the sliding filament theory by creating a presentation/picture board/board game.
- Guide learners through an examination-style extended question on the sliding filament theory, explaining the process. Follow up with tutor-directed Q&A.
- Introduce types of muscle contraction and muscle fibre type recruitment. Give learners illustrations of a variety of sporting actions/movements and ask them to discuss the illustrations in terms of muscle fibre type recruitment. Use a whole group discussion to recap and embed the theory of muscle contraction.

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- Use starter and recap tasks to embed location and function of skeletal muscle.
    - Give learners an activity to complete to locate different types of muscles.
- Practical session: skeletal muscles, muscular contraction and antagonistic muscle pairs. You could invite a guest coach to exemplify the muscular system in action.
- Invite a guest speaker, such as a personal trainer or sports analyst, to discuss all aspects of their role, highlighting the importance of understanding anatomy.
- Formally teach types of movement. Follow up with group work and practical activities. Engage learners in a range of movements/activities that include different joint movements. Suggestion: learners play 'musical movements' (an adaptation of musical statues), whereby the tutor shouts a type of movement (e.g., 'circumduction') and learners have to stop and demonstrate an appropriate version of the movement to progress to the next round.
- Organise an educational trip to consolidate all knowledge within the module. There will be local options but recommendations include:
    - Royal College of Surgeons – Wellcome Museum (https://www.rcseng.ac.uk/museums/wellcome/about-the-wellcome-museum-of-anatomy-and-pathology)
    - Science Museum – sport section specifically (http://www.sciencemuseum.org.uk/)
    - Museum of Medicine and Health (http://www.mms.manchester.ac.uk/museum/).
- Consolidate individual learner understanding by producing quizzes for learners.

Topic F – Analysis of the skeletal and muscular systems and how they produce movements in sport and exercise

Topic F should be embedded within all prior topics. It is the culmination of all prior knowledge, which will enable learners to make appropriate and reasoned judgements and analysis of movement.

- Formally teach the phases of sport and exercise movement, making sure you break down the specific phases of movement. Use whole group discussion, supplemented with practice questions and directed Q&A.
- Introduce analysis of movement, using visual representations and video clips via video sharing websites where possible. You may also wish to use tools such as Coach's Eye and Dartfish when breaking down skills and analysing muscle, limb and body movement.
- Examination preparation. Learners revise independently and prepare for the examination. You can use this time to revise key topic areas or areas in which learners feel they need to improve their understanding.
- Learners sit a mock paper and receive feedback to identify areas to work on before the examination. You should go through the mock paper with the class. (Suggestion: get learners to peer mark section A.)

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

This is a mandatory unit and underpins knowledge throughout the qualification.

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Sport and Exercise Science. Check the Pearson website (http://qualifications.pearson.com/en/support/published-resources.html) for more information as titles achieve endorsement.

Textbooks

The following textbooks give comprehensive coverage of this unit, enabling learners to develop their understanding of functional anatomy and improve their personal learning skills. The range of resources also enables learners to understand how this unit links with many other aspects of sport and exercise science.

Adams M et al, *BTEC National Sport and Exercise Sciences Student Book*, Pearson Education, 2016 ISBN 9781292133959

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

Marieb E and Hoehn K, *Human Anatomy & Physiology* (10th Edition), Pearson Education, 2015 ISBN 9781292097060

Milner C, *Functional Anatomy for Sport and Exercise*, Routledge, 2008 ISBN 978041543979

Palastanga N, *Anatomy and Human Movement* (Fifth Edition), Butterworth-Heinemann, 2006 ISBN 9780750688147

Sharkey BJ and Gaskill SE, *Fitness and Health* (Seventh Edition), Human Kinetics, 2013 ISBN 9780736099370

Stafford-Brown J and Rea S, *BTEC Level 3 National Sport and Exercise Sciences* (Fourth Edition), Hodder Education, 2016 ISBN 9781471878633

Tortora GJ and Derrickson BH, *Principles of Anatomy and Physiology* (14th Edition), John Wiley & Sons, 2014 ISBN 9781118808436.

Journals

The following journals give comprehensive and up-to-date research into the field of functional anatomy, demonstrating its impact on human functionality in relation to everyday activities and sporting performance.

American College of Sport Medicine's Health and Fitness Journal

British Journal of Sports Medicine

Exercise and Sport Sciences Reviews

International Journal of Sports Science and Coaching

Journal of Anatomy

Journal of Sports Sciences

Medicine and Science in Sports and Exercise

Research Quarterly for Exercise and Sport

Websites

The following websites give further information on a range of topics, and work well if used in association with the textbooks and journals recommended. They give good sources for information ranging from the fundamentals of human anatomy and physiology through to its application to movement analysis in sport and exercise.

www.1st4sport.com – Coachwise – a specialist publisher and online retailer for sports resources, including books, DVDs, training tools and software.

www.acsm.org – American College of Sports Medicine – the largest sports medicine and exercise science organisation in the world, dedicated to promoting educational and practical applications of sport and exercise science.

www.bases.org.uk – The British Association of Sport and Exercise Sciences – the professional body for sport and exercise science in the UK.

www.humankinetics.com – Human Kinetics – a publisher of journals, books, software and other products relating to the world of sport and exercise.

www.sportsci.org – Sport Science – a peer-reviewed journal publishing the latest sports research.

www.sportscoachuk.org – Sports Coach UK – the UK's coaching agency, promoting the education of everyone involved in teaching sport and sport-related subjects; many services are free of charge or heavily subsidised.

www.topendsports.com – Topend Sports – the ultimate sport and science resource giving information about sport, sport science, fitness and nutrition.

Unit 3: Applied Sport and Exercise Psychology

Delivery guidance

Approaching the unit

This unit is designed to introduce learners to sport and exercise psychology, presenting the key concepts and theories that are central to sport and exercise psychology. Learners will be encouraged to find out information for themselves and consider how the concepts and theories help them to understand their own experiences and performances in sport. The applied focus of the module enables learners to consider the experiences of top sports people, their coaches and their own experiences. While presenting some of the theory to learners, the focus should be on learners working both independently and in groups to develop their own understanding of the concepts.

The unit has a practical element and it is vital that learners are given opportunities to experience psychological interventions, so that they are able to understand them and appreciate when they could be used with sports people and people taking exercise.

While each topic has its own discrete content, there are links between them. In particular, Topic F can be linked to all the other topics as it covers the psychological interventions that relate to the content of Topics A–E. For example, it makes sense to cover goal setting, from Topic F, when you cover motivation in Topic A. It is also important to start working towards the final assessment in the early topics, so that learners will be familiar with the demands of the assessment from the start and be well prepared when they complete the external assessment.

Delivering the topics

Topic A

When delivering this topic on motivation, it is useful to keep referring back to the learners' experiences of being motivated (or not being motivated) and to the reasons underlying their motivation/demotivation. Once learners understand the basics of the types of motivation and the theories of motivation, they can reflect back on their own experiences and use these concepts and theories to understand their behaviour.

This topic offers opportunities for learners to examine the motivation of sports people and, in particular, to assess attributions that managers and athletes make for their successes and failures. This can be done by looking at post-event reports in newspapers or online.

As part of learning about motivation, you could introduce learners to the methods of influencing motivation, covered in Topic F. It is a good opportunity to introduce the concept and practicalities of goal setting, and possibly even introduce performance profiling as well.

It would be beneficial to introduce learners to a case study about the motivation of an athlete, which deals with aspects of the theories covered at the end of this

topic. This would introduce learners to the type of activity they will have to complete for their assessment.

Topic B

Again, it is useful to refer back to learners' own experiences of playing sport, particularly when they felt under pressure. They may not have realised it at the time, but they were probably experiencing high levels of arousal accompanied by stress and anxiety. It is worth drawing out these experiences as you introduce each topic.

This topic offers opportunities for learners to work in pairs or small groups to research theories of arousal and performance, and different types of anxiety. Learners can share their findings in group presentations and discussions.

This topic presents opportunities for practical work, where learners can spend time observing how sports people behave in stressful situations, how this affects their body language and facial expressions, as well as any changes in their behaviour. You could use practical sessions to allow learners the opportunity to experience a range of methods of controlling arousal – relaxation techniques and imagery to lower arousal, and energising methods to increase arousal levels.

You can finish the topic by presenting a case study specific to arousal, stress and anxiety and give learners the chance to practise the skills needed in the external assessment.

Topic C

You could introduce this topic by asking learners to consider sports people who they think are self-confident, and the qualities that make them self-confident. Then learners can look at the theory and see how it fits in with the conclusions that they have drawn.

Learners can work in small groups or pairs to consider the outcomes of being self-confident or lacking self-confidence, and then look at the techniques that can be used to develop self-confidence. At this point, you could consider introducing interventions such as imagery and self-talk.

At the end of the topic, you could introduce a case study that gives learners the opportunity to apply their knowledge of Vealey's self-confidence model and Bandura's self-efficacy theory.

Topic D

This topic is concerned with a more theoretical area, covering subjects that are currently attractive to researchers. There are still opportunities for paired and group activities. You could give learners statements that reflect a fixed mindset or growth mindset and asked them to differentiate between the two. Additionally, learners could develop questionnaires to assess a partner's resilience or traits of perfectionism.

Topic E

You could present this topic by asking learners to reflect on their own experiences of teams: in particular, teams that worked very well and teams that did not achieve what they should have achieved. Early in the study of this topic, you could introduce a group activity to illustrate the benefits and drawbacks of working in groups.

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The use of the Group Environment Questionnaire (GEQ), which can be downloaded from the internet, is a good way for learners to consider the factors that influence group performance and, in particular, different types of cohesion.

Leadership presents a good opportunity for learners to work together to decide who they think are great leaders and what attributes make them great leaders. This can inform your presentation of Chelladurai's multidimensional model (MDM), and how, when discussing leadership, it is not just qualities/traits that are important.

It is vital to finish this topic with case study work, so that learners can start to appreciate how to address a case study that covers group dynamics.

Topic F

You could deliver Topic F at the end of the unit; however, it is most meaningful when delivered across the unit, at the same time that an intervention matching the topic is being studied. It may be that you take a mixed approach, where you teach some interventions in an integrated fashion and others discretely.

For example, you could teach goal setting, and possibly performance profiling, as part of Topic A, and you could deliver arousal control (relaxation and energising techniques) as part of Topics B and C.

This topic presents the best opportunity to invite a guest speaker. Professional clubs may have sport psychologists, or you can source practising sport psychologists through higher education establishments. You could ask the guest speaker to explain how psychological interventions in general can benefit sports people, and how they specifically work with a sportsperson to develop that person's psychological skills.

Assessment guidance

Assessment is conducted externally and will consist of a three-hour examination, in the form of a case study that covers content from several content areas.

Learners will be given the external assessment provided by Pearson, which contains a case study. The case study will change each series. The external assessment contains three set questions which will remain the same for each series. Learners need to be equipped with the skills necessary to analyse a case study. They will be expected to identify key psychological factors in the case study and then go on to explain psychological theories that are specific to the case study. To complete the assessment, learners then will need to identify and apply appropriate psychological interventions to meet the needs of the people in the case study.

Getting started

This provides you with a starting place for one way of delivering the unit. Activities are provided in preparation for the external assessment.

Unit 3: Applied Sport and Exercise Psychology

Introduction

Introduce the unit to learners by explaining what sport psychology is, and its role in improving the performances of sports people and teams. Then outline the six topics that will be covered and explain that the unit will be assessed externally, using a case study approach.

A good introductory activity to get learners thinking about sport psychology is to ask them to select three or four sports performers and decide on between five and 10 psychological characteristics that contribute to their success. Learners can then compare these to the characteristics chosen by other learners. You might ask learners to consider which psychological characteristics could be developed to help these sports performers improve their performance, and how they would go about achieving this.

Then you can explain that sport psychology examines psychological characteristics such as motivation, self-confidence, control of stress and anxiety and development of mindset to improve performance. These characteristics are developed through psychological interventions or techniques such as goal setting, imagery and relaxation techniques. Sport psychology provides a toolkit for sports performers to use when they need them.

Sport psychology uses experiments to illustrate theories and group activities to develop understanding of theories. It is important to implement differentiation during the delivery process so that learning can take place in groups of mixed ability, and that independent learning is designed to meet the needs of learners of differing abilities.

Topic A – Motivation for sports and exercise

- Introduce Topic A by explaining that it is about different types of motivation and how motivation can be influenced. Learners can then prepare definitions of motivation and assess whether athletes are intrinsically or extrinsically motivated.
- Invite a guest speaker to discuss different types of motivation, including:
    - how different sports performers are motivated?
    - how they use extrinsic rewards and their effects on intrinsic motivation?
    - how different types of motivation cause different types of behaviour?
- Group activity – set up an experiment in which five learners are told that they will play five points of table tennis, badminton or tennis against an opponent of their choice. These learners are asked to choose one of the following opponents: one who is much better than them, one at the same level or one much worse than them. They then play the game and record the outcome of the game. After their match, they are asked the following questions.
    - How did you feel about winning or losing?
    - Why did you choose that opponent?
    - Did your choice of opponent affect your motivation level?
- Outline the main points of Need Achievement Theory and Achievement Goal Theory. Highlight the five components that make up Need Achievement Theory, and the difference between task-oriented and outcome-oriented individuals. Refer back to

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the experiment and make observations about why learners chose the opponents they did, and why they felt how they did after their success or failure. Learners can also make similar observations.

- Learners can complete a small group activity to identify and understand the types of attributions sports people make about success or failure. Learners can use newspapers and websites to find examples of attributions made by coaches and athletes to explain their success or failure. Learners assess whether these examples reflect reality, and why these attributions have been made. They should then feed back their findings to the other groups.
- Lead a discussion in which learners discuss why coaches, managers and athletes may choose to use different attributions to assess their success and failure, and the impact of specific attributions on future chances of success.
- Learners work in small groups of four or five. They should choose a sports team as a case study and assess its current motivational climate. Learners should look at each of the four factors that influence the motivational climate and make recommendations about how the climate could be developed to make it more motivational for the athletes. Learners should create a presentation in the form of a poster to show to other learners.
- Introduce the concept of goal setting, and the different types of goal that can be set, followed by a small group activity in which learners prepare posters to show a definition for and example of each of the principles of goal setting.
- Use an individual activity in which learners set short-term and medium-term goals for an individual who has just started exercising and wants to achieve a specific goal in the next three months (e.g., run a 5k race, lose 4 kg).
- Introduce assessment by presenting a case study. Explain how learners should assess the case study by identifying:
    - issues the subject is experiencing
    - possible links to theory
    - psychological interventions that may be appropriate
    - intended outcomes of the intervention.

Topic B – Competitive pressure in sport

- Introduce Topic B and its content by explaining that it is about stress, arousal and anxiety, and how they impact on sports performance.
- Set up the following experiment to illustrate the effects of arousal. Divide learners into four groups. Assign an arousal–performance theory to test each group. Each group should choose a skill to test such as taking penalties, catching and throwing a ball or completing a standing jump. These three tests can be done in three conditions: i) in a room with just the assessor, ii) in a room with an audience of four or five people and iii) in a room of 20 people (or full class) with a prize to play for. Once the five learners have completed the experiment, the mean scores should be worked out. The five learners should then discuss which condition they found to be most stressful and the impact it had on their results. These research findings can then be used to illustrate the different theories of the arousal–performance relationship.
- Use formal delivery to introduce the concept of stress and its negative and positive components, introducing the four-stage stress process. Learners should work together to consider examples of the four-stage stress process in action, and establish the internal and external sources of stress.
- Present the use of questionnaires as a means of measuring anxiety levels.

- Using textbooks, journal and online sources, learners should research different types of anxiety, theories of anxiety and the anxiety–performance relationship.
- Divide learners into small groups and give each group examples of assertive/aggressive behaviour in written or visual form. Learners should decide in which of the four categories of the stress process the behaviour fits. Learners should then develop three or four criteria for each type of behaviour, and then use these criteria to justify why they have placed each behaviour in that category.
- A plenary session will give learners the opportunity to consolidate their knowledge of each type of behaviour, while also realising that there are grey areas and it is sometimes very difficult to assess in which category a behaviour fits.
- You can use practical activities to give learners experiences of arousal control techniques, such as progressive muscular relaxation, mind-to-muscle techniques, breathing control and energising techniques.
- Introduce a case study in which a sportsperson is experiencing stress and anxiety due to high levels of arousal. Learners should analyse the case study and present the following information.
    - What are the main issues the sportsperson is experiencing?
    - How can these be explained by theories?
    - Which interventions would be appropriate to support the sportsperson?

Topic C – Effects of self-confidence, self-efficacy and self-esteem on sport and exercise performance

- Introduce Topic C and its content. Explain that it is about self-confidence and self-esteem, and how these affect sports performance.
- You can use small group activity to get learners thinking about self-confidence and its relevance to sports performance. Ask learners to prepare a poster that shows four athletes who they consider to be self-confident and, in each case, produce a bullet-point list that illustrates what makes these people self-confident. Learners should present their poster to the other groups, with justifications for each of their choices.
- Using textbooks and working individually, learners should research journal articles and online resources for the following:
    - Vealey's self-confidence model
    - constructs, sources and consequences of self-confidence.
- Introduce the relationship between self-confidence and self-efficacy and then organise a small group activity in which learners produce a spider diagram to show:
    - factors that influence self-efficacy
    - how these factors impact on efficacy expectations and performance.
- Lead a practical activity in which learners experience imagery and its use in influencing self-confidence. You should read from a prepared script and ask the learners to write up how effective they found the technique.
- Introduce a case study in which a sportsperson is experiencing problems with self-confidence. Learners should analyse the case study and present the following information:
    - the main issues the sportsperson is experiencing
    - how these can be explained by theories
    - the interventions that would be appropriate to support the sportsperson.

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Topic D – Mindset in sport and exercise performance

- Introduce Topic D and its content. Explain that it is about mindset and, more specifically, about perfectionism and resilience, and how these affect sports performance.
- Use a practical experiment to introduce learners to the concept of fixed mindset and growth mindset. Divide the group into two smaller groups. Either locate each group in separate rooms, or on separate sides of the classroom. Present learners with a mental puzzle, such as a Sudoku puzzle. Tell the first group that the task is too difficult for them and that they are unlikely to be able to complete it. Tell the second group that the harder they work at it, the better they will become at the task, and that they will be successful. You record the amount of time that each learner spends on the task and how successful they have been. Work out the results for each group as a mean to make a comparison. Learners will discuss why the results came out this way and how they felt completing the task.
- Working individually, and using textbooks, journals and online sources learners conduct research covering Dweck's theory of fixed mindsets and growth mindsets. Learners should also explore how Dweck's theory can be used to influence the behaviour of coaches and athletes.
- Use a paired practical activity to develop learners' understanding of resilience. Working in the pairs, learners should develop a questionnaire that can measure the resilience of an individual. Once you have approved the pair's questionnaire, they can use it to assess the resilience of a selection of fellow learners.
- Ask learners to complete an activity in which they source a questionnaire to assess their perfectionist traits. They should then complete the questionnaire, using it to consider the extent to which they exhibit perfectionist behaviours.
- Introduce a case study in which a sportsperson is exhibiting a fixed mindset and low resilience. Learners should analyse the case study and present the following information:
    - the main issues the sportsperson is experiencing
    - how these can be explained by theories
    - the impact this is having on performance
    - the interventions that would be appropriate to support the sportsperson.

Topic E – Group dynamics in sport

- Introduce Topic E and its content. Explain that it is about groups and teams, and the factors that impact on their performance.
- Involve learners in a practical experiment to introduce to the issues involved in working in groups. Ask learners to complete a group activity, such as 'Starting a new civilisation', to assess how they function as a group and the benefits and drawbacks of working as a group. Then ask learners to reflect on the activity, including assessing the stages of group development and the role each learner played within the group.
- Use formal delivery to explain the differences between groups and teams, and to introduce Steiner's model of group effectiveness.
- Learners can then complete a paired activity in which they consider the factors that may lead to groups not achieving the outcomes that reflect the skills of the team members. Ask learners to choose a well-known team as a case study, and why they think the team they chose is particularly effective or ineffective. Each pair should present their main findings to the other pairs.

- Use a plenary session to gain feedback from learners about 'process losses' in sports teams and to explain the concept of 'social loafing' in sports teams.
- Introduce the concept of cohesion and lead a discussion about the levels of cohesion in the groups in which learners are involved. This can lead on to learners completing the GEQ and discussing the outcomes of the questionnaire.
- Using textbooks and online resources, learners should complete independent research into the difference between task cohesion and social cohesion, and their relative importance in the performance of the group. Follow this up with a group discussion in which learners adopt opposing positions in a debate about which type of cohesion is most important to performance.
- Working in small groups, learners prepare a poster with the title 'What makes a great leader?' The groups can choose two or three sports leaders and make a list of the attributes that make that leader 'great'. The groups can then compare their chosen leaders, and lists of their attributes, with those chosen by the other groups.
- You should use formal delivery to introduce Chelladurai's MDM of leadership, and what is involved at each stage. Learners should use this model to review their choices of leader, and to decide whether their leaders would be effective in other situations.
- Introduce a case study in which a sports team are not functioning as effectively as they could and not producing the best results they are capable of. Learners should analyse the case study and present the following information:
    - the problems the team are experiencing
    - how these can be explained by relevant theories
    - the interventions that would be appropriate to help the team improve.

Topic F – Psychological interventions for sports performance and exercise

- Introduce Topic F and its content. Explain it is about psychological interventions and how they are used in sports and exercise environments. Remind learners that they have already been introduced to most of the interventions but this topic will examine the interventions in more detail.
- Working in pairs for a practical activity, learners should produce a performance profile of their partner. They should produce 10 constructs, assess each construct and then plot the performance profile. They then assess the results and draw up a list of strengths and weaknesses for their partner.
- Lead a discussion about the process of performance profiling. What did learners identify as the strengths and weaknesses of the process from the activity above?
- Use formal delivery to explain how psychological interventions can be matched to specific sports people or teams.
- In small groups, learners should produce a poster that shows the links between psychological interventions and issues.
- Use formal delivery to explain external assessment and how to address the case study. You can use the Sample Assessment Material as an exemplar when examining the types of information that should be covered by the learner.

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

This unit links to:

- Unit 5: Applied Research Methods in Sport and Exercise Science
- Unit 6: Coaching for Performance and Fitness
- Unit 8: Specialised Fitness Training
- Unit 9: Research Project in Sport and Exercise Science
- Unit 10: Physical Activity for Individual and Group-based Exercise
- Unit 11: Sports Massage
- Unit 12: Sociocultural Issues in Sport and Exercise

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Sport and Exercise Sciences. Check the Pearson website (http://qualifications.pearson.com/en/support/published-resources.html) for more information as titles achieve endorsement.

Textbooks

Carron AV and Eys MA, *Group Dynamics in Sport* (Fourth Edition), Fitness Information Technology, 2011 ISBN 9781935412359

Cox RH, *Sport Psychology: Concepts and Applications* (Seventh Edition), McGraw-Hill Higher Education, 2011 ISBN 9780071086226

Rea S, *Sports Science: A Complete Introduction,* John Murray/Teach Yourself, 2015 ISBN 9781473614895

Stafford-Brown J et al, *BTEC Level 3 National Sport and Exercise Sciences* (Fourth Edition), Hodder Education, 2016 ISBN 9781471878633

Syed M, *Bounce,* HarperCollins/Fourth Estate, 2011 ISBN 9780007350544

Thatcher J, Day M and Rahman R, *Sport and Exercise Psychology*, Palgrave MacMillan, 2011 ISBN 9781844458394

Weinberg RS and Gould D, *Foundations of Sport and Exercise Psychology* (Sixth Edition), Human Kinetics, 2014 ISBN 9781450469814

Journals

The following journals provide the latest research in sport and exercise psychology, dealing with content areas that are covered in the unit specification.

International Journal of Sport Psychology

Journal of Applied Sport Psychology

Journal of Sport & Exercise Psychology

The Sport Psychologist

Websites

http://www.appliedsportpsych.org/ – The website of the Association for Applied Sport Psychology provides links to research as well as articles.

http://www.mindtools.com/page11.html – The MindTools website provides tests and other resources that can be used in practical activities.

http://orb.essex.ac.uk/bs/sportpsy/ – The Sport Psychology Portal is part of the University of Essex website. It provides a range of resources for developing knowledge of sport psychology.

http://www.thesportinmind.com/ – The Sport in Mind website offers articles on all areas of sport psychology.

http://www.vanguard.edu/psychology/amoebaweb/exercise-psychology/ – The Exercise and Sport Psychology website provides articles and other resources on sport psychology.

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Unit 4: Field- and Laboratory-based Fitness Testing

Delivery guidance

Approaching the unit

This unit gives learners the opportunity to develop the skills that reflect those used by an applied sports scientist. This will not only allow learners to develop a comprehensive understanding of fitness testing but also give them the key knowledge needed during the important stages before any practical activity. The unit is largely practical based; therefore, all learners should attempt full participation throughout in order to appreciate the full roles and responsibilities of a sports scientist.

With the development of their applied skills, learners will be able to carry out an independent mini case study to investigate the physiological characteristics of a performer. Within the study, learners will be able to develop a performance profile, gather data for analysis, make statistical calculations and draw conclusions from its outcomes.

Delivering the learning aims

Learning aim A

Learning aim A gives learners an opportunity to identify the stages required when preparing for laboratory and experimental testing. Learners will be expected to identify safe working practice, and understand that they need to ensure that the safety of a client remains paramount during any testing procedure. Learners will become familiar with the ethical testing regulations that govern all testing protocols. This may include informed consent forms, right to withdraw and ethics forms. Having an appreciation of both health and safety and of the ethical applications, learners will be expected to identify how these factors may influence the validity and reliability of a study, and take part in an interview for a specific job role in the sports industry.

By developing an understanding of these skills, learners will appreciate the importance of client care and safety during practical activities. It is essential that learners reflect on the industry skills required to appreciate individual needs fully when conducting any physical activity in a physically active population.

This learning aim could be best supported using a range of individual and paired activity work. For example, learners may use the opportunity to interact with one another on problem-solving activities, whereas learners can work independently when constructing questionnaires for health-check assessments, and interpreting their outcomes. Learners are required to present their work well, including the use of correct spelling and punctuation, and the use of correct units of measurement. These skills can be incorporated in work on health questionnaires, enabling learners to challenge their understanding of health assessment in an applied sports science context.

Learning aim B

Having gained an understanding of the stages required to prepare a subject for testing, learners will develop their skills by applying their knowledge to follow testing protocols. This learning aim should be practically focused, allowing learners to use a range of anthropometric assessment methods to determine an individual's body composition. Testing protocols may include Durnin/Womersley and Jackson/Pollock protocols, body mass index (BMI) and bioelectrical impedance analysis (BIA) assessments. Following the collection of data, comparisons to normative data (norms) should be made, explained and conclusions drawn for further discussion. As a separate assessment procedure, learners should become familiar with the Heath–Carter somatotype protocol. Learners will be expected to gather relevant data and make calculations, in order to predict individual(s) somatotype. This information should be plotted on a somatochart, conclusions drawn from its findings and relevant links made to sport and exercise performance.

As proactive sports scientists, it is important that learners are able to assess the composition of the human body. The testing protocols aim to employ the skills used in the industry, allowing their subsequent application to reflect those used by aspiring fitness professionals.

This learning aim may be best supported by paired and group practical activities, allowing learners to interact and gather the data needed throughout assessment procedures. It is essential that skinfold analysis is conducted using paired work activities, as this allows learners to gain practical activity and hands-on experience. When performing calculations, learners can work with their peers, enabling them to support each other when using the series of complex calculations needed to estimate somatotype. The numeracy and literacy skills required in the industry can be incorporated in this aim, when collecting data and when explaining the outcomes based on the testing activities.

Learning aims C and D

It is envisaged that these learning aims will challenge learners' understanding of applied laboratory and experimental methods. Within the context of an independent research case study, it will allow learners to appreciate the practical role of a physiological sports scientist.

As the learners are now competent in pre-test procedures, they can take part proactively in the administration of a range of field- and laboratory-based testing. There is an expectation that all learners will partake in all activities. From the resulting data collection, learners may develop their numeracy skills by interpreting the findings and performing a range of complex calculations for analysis.

Using a practical research design, learners independently prepare and carry out a mini case study, which may explore performance profiling. From a range of physical fitness tests, learners will be able to identify fitness components and their influence on exercise performance. Learners can create a study title, its aims and an introduction, apply study methods, collect results, perform an analysis of the data, discuss the study outcomes and draw conclusions. They can then prepare a small case study to evaluate performance prediction and physiological profiling.

Learning aim C relies heavily on paired and group interaction. Each learner should try to work in a team, collecting numerous pieces of data from a variety of testing protocols, which may be interpreted in their summary analysis for learning aim D. Learner interaction enables them to organise and develop ideas

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that can be incorporated in their practical activities. In learning aim D, learners may work more independently, with a reliance on their own interpretation of the study findings, based on the practical tests performed. Learning aim D may encourage learners' problem-solving skills, with a focus on data analysis and interpretation of their outcomes. Both learning aims aid the development of numeracy and literacy skills, in the context of sport and exercise science, through the use of a mini case study that requires collection of data for an analysis and explanation of its outcomes.

Learning aim	Key content areas	Recommended assessment approach
A Examine the preparation required prior to sport and exercise field- and laboratory-based testing	**A1** Health and safety in a sport and exercise laboratory **A2** Ethical considerations when conducting sport and exercise testing **A3** Validity and reliability of testing protocols when conducting sport and exercise assessments	A written report examining the health, safety, risk, ethical considerations and assessment variables
B Undertake anthropometry and somatotype testing procedures in sport	**B1** Anthropometric assessment methods applied within the sport and exercise laboratory **B2** Somatotype profiling applied within the sport and exercise laboratory	A report evaluating the use of testing protocols and recorded data in predicting sports performance, supported by observation/video evidence of fitness testing administration and recorded results from each test
C Explore the use of field- and laboratory-based protocols in sport and exercise sciences	**C1** Applied laboratory and experimental testing **C2** Experimental data collection methods used within the sport and exercise laboratory **C3** Data handling and evaluation of outcomes when conducting laboratory experimentation	A report evaluating the use and outcomes of field- and laboratory-based testing and formal research design. The report will justify the protocols used and will be supported by observation through video evidence of fitness-testing administration and recorded results from each test.
D Explore profiling of a sports performer following practical research design using field- and laboratory-based testing	**D1** Scientific application of experimental protocols in sport and exercise science **D2**Performance profiling through research design	An evaluative report focusing on the effectiveness of client profiles created using field- and laboratory-based testing protocols

Assessment guidance

It is envisaged that this unit is delivered with as much practical emphasis as possible, which may be integrated in each of the learning aims. Access to a sports hall, gym, dedicated sports laboratory and adequate outdoor space would be supportive in the delivery of this unit.

In the assessment of learning aim A, learners should be encouraged to evaluate the facilities, either on site or in a suitable area where testing participation may take place. Learners can evaluate the surrounding environment with a participant/subject of their choice.

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In learning aim B, it is imperative that learners engage with the practical activities, to allow them to assess their own and/or other's anthropometric measurements. The facilities should include access to a range of kinanthropometric equipment, such as stadiometers and scales, measuring tapes and BIA equipment. Additionally, centres require skinfold measuring equipment for assessing somatotype, to enable learners to complete the learning aim.

Learning aim C will require access to a range of fitness-assessment equipment, allowing learners to embrace and take part in varying practical activities. Specific equipment should include stopwatches, blood pressure measuring equipment, heart rate monitors and finger pulse oximeters, multistage fitness test package and a cycle ergometer (including Wingate testing equipment).

Learning aim D may be assessed in conjunction with learning aim C. The assessor may create one assignment that applies and evaluates practical testing activities. With the collection of data, access to the Statistical Package for the Social Sciences (SPSS) may aid the interpretation of data, although statistical tests can also be performed using Microsoft Office applications.

Throughout the assessment plan, it is envisaged that learners will develop a range of employability skills that are essential to aspiring sports scientists.

Learners are encouraged to self-manage their practical testing, conducting testing protocols that coordinate a group of clients so as to gain meaningful results. It is essential that learners develop good communication skills throughout, enabling clear instructions to be given, allowing clients to be guided through a range of practical activities.

By conducting practical fitness tests, learners will be able to collect data to present in an appropriate format. Through the use of IT applications, learners will be able to analyse the data findings, performing a range of statistical tests to develop an understanding of the testing outcomes.

Getting started

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

Unit 4: Field- and Laboratory-based Fitness Testing

Introduction

Introduce learners to the unit and discuss the differences between field- and laboratory-based fitness testing. Learners can explore their understanding of the testing protocols that may be used regularly in sport and exercise science, and identify the physiological characteristics they aim to measure.

Learning aim A – Examine the preparation required prior to sport and exercise field- and laboratory-based testing

- Learners can be introduced to risk assessments and their importance in field and laboratory testing. Working independently, learners could create and conduct risk assessments of their fitness-testing environment. Learners may wish to use a RAG (red, amber, green) system, or a scale, to highlight potential hazards.
- In small groups, learners can discuss the risks they identified, and develop posters to present to the rest of the class highlighting potential hazards and how each of the risks may be overcome. A debate could encourage discussion on how the class feels about the risk, and how this may affect safe participation in activities. This activity may form part of their initial assignment.
- Learners could be given examples of health questionnaires, which may enable them to self-assess their own health status before field and laboratory testing. A PAR-Q (physical activity readiness questionnaire) handout could be given to learners to complete and reflect on its use, and their responses.
- Learners could self-assess their own health status, using a number of fitness assessments. Learners may be introduced to the basic procedures of measuring a subject's height, weight, heart rate, peak flow and blood pressure; calculating their BMI, waist/hip ratio and body fat percentage (using BIA). These procedures may allow learners to familiarise themselves with health and safety procedures within the laboratory.
- Learners could construct their own health assessment questionnaires independently, concentrating on the key information needed for testing. A class debate could discuss the appropriateness of the questions asked. As a follow-up activity, learners could produce a scenario-based questionnaire to explore specific situations, where special populations require support for varying needs.
- Learners could be given a worksheet of scenarios, in which testing validity and/or reliability procedures may be analysed, and whether these tests are fit for purpose. For example, learners are given a number of testing scenarios to identify whether the protocols are able to be valid and reliable. Group feedback can be used to explore the outcomes.
- Learners may be introduced to ethical testing, using slide presentations, by asking them to identify ethical values in fitness testing. Learners may identify examples, such as data protection and client confidentiality, and identify how and why these must be adhered to for meaningful results.
- Learners can research and develop their individual ethics forms in preparation for testing. This template may also be used to develop part of their case study for

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learning aim D.

Learning aim B – Undertake anthropometry and somatotype testing procedures in sport

- Learners could be introduced to the concept of anthropometry with a tutor-led practical activity, demonstrating the techniques used and how to collect measures correctly.
- Following the demonstrations, learners can be encouraged to apply the techniques independently in pairs/small groups. Supported practice allows learners to self-assess and investigate their own anthropometric measures. It may be supportive to allow learners adequate time to practice and develop their skills before any formal assessment.
- Independent practical testing protocols may include skinfold measurements for Durnin and Womersley, and Jackson and Pollock, assessment protocols; BMI and BIA assessment, along with body weight measurements, and proportions of the body shape and size.
- Learners should investigate the outcomes of their data against that of the standardised norms measures independently, making links to sports performers, and understanding their potential profiling for performance.
- Using worksheets and independent research resources, learners can investigate somatotype body shapes – endomorph, ectomorph and mesomorph. Learners can explore potential somatotype links with sports performance, i.e., profiling with norms data. Learners can engage in group discussions on the reasons why body shape may be a key determinant to performance success.
- Learners can be introduced to the Heath–Carter assessment method, using the practical skills they have developed when conducting their anthropometric measures. Give the learners Heath–Carter assessment forms to complete the measures required to estimate their individual somatotype.
- There are opportunities for learners to develop their numeracy skills by accurate collection of testing data, and performing a series of calculations to establish their individual somatotype. These values can then be plotted onto an appropriate somatochart.
- Using the results of the somatochart, and the Heath–Carter assessment form, learners can complete part of their assignment by accurately recording somatotype data findings. Learners can compare their self-assessed results against that of a sports performer to reflect on their physiological performance abilities.

Learning aim C – Explore the use of field- and laboratory-based protocols in sport and exercise sciences

Learning aim D – Explore profiling of a sports performer following practical research design using field- and laboratory-based testing

- Learners should be introduced to a range of fitness-testing procedures. Individual methods can be discussed, with potential links made to validity and reliability.
- Learners can create a logbook to record all the testing they have conducted in these learning aims. This could be used to support completion of assignment 3.
- Learners should be introduced to a range of field-based testing protocols, and proactively take part in administering and participating in their application, including the multistage fitness test, 12-min run, running-based anaerobic sprint test, flying 30-m sprint, Illinois agility test and T-drill test, running-based anaerobic

sprint test.

- Learners should be introduced to a range of laboratory-based testing protocols, and proactively take part in administering and participating in their application, including the Astrand–Rhyming cycle ergometer test, running-based anaerobic sprint test (RAST), 30-s Wingate cycle test, vertical jump test, 1RM tests, back dynamometer, grip dynamometer, BMI assessments, bioelectrical impedance analysis, 1-min press-up test, 1-min sit-up test, static flexibility testing, goniometer testing and sit-and-reach test.
- There are opportunities for learners to develop their numeracy skills when collecting data in tables and carrying out a number of calculations, such as mode, mean, median and range, to establish relationships and differences, standard deviation, t-tests, Pearson's product coefficient (r) and relationships drawn to comparative norms. As a follow-up activity, learners can produce appropriate charts and graphs to aid the interpretation of the data they have collected.
- For completion of their assignment, learners can carry out six individual fitness tests, of which at least two should be aerobic based. Learners can develop and implement a research study individually, which may include preparing a study title, aims, introduction, method, results, analysis, discussion, conclusion, and give research evidence of study (references/bibliography).
- Learners may use the findings of their study to discuss with others in their group, and relate their outcomes to that of an elite performer.

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

This unit links to:

- Unit 1: Sport and Exercise Physiology
- Unit 2: Functional Anatomy
- Unit 5: Applied Research Methods in Sport and Exercise Science
- Unit 6: Coaching for Performance and Fitness
- Unit 8: Specialised Fitness Training
- Unit 9: Research Project in Sport and Exercise Science
- Unit 10: Physical Activity for Individual and Group-based Exercise

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Sport and Exercise Science. Check the Pearson website (http://qualifications.pearson.com/en/support/published-resources.html) for more information as titles achieve endorsement.

Textbooks

Adams M et al, *BTEC National Sport and Exercise Sciences Student Book*, Pearson, 2016 ISBN 9781292133959

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American College of Sports Medicine (ACSM), *ACSM's Guidelines for Exercise Testing and Prescription* (Ninth Edition), Lippincott Williams and Wilkins, 2013 ISBN 9781609139551

Beam WC and Adams GM, *Exercise Physiology Laboratory Manual* (Seventh Edition), McGraw Hill Higher Education, 2013 ISBN 9780078022654

Coolican H, *Research Methods and Statistics in Psychology* (Sixth Edition), Routledge, 2014 ISBN 9781444170115

Eston R and Reilly T, *Kinanthropometry and Exercise Physiology Laboratory Manual: Tests, Procedures and Data*, Routledge, 2008 ISBN 9780415437233

Eston R and Reilly T, *Kinanthropometry Laboratory Manual: Anthropometry and Exercise Physiology*, Routledge, 2008 ISBN 9780415466714

Foss ML, *Fox's Physiological Basis for Exercise and Sport*, McGraw-Hill, 2000 ISBN 9780072420692

George D and Mallery P, *IBM SPSS Statistics 21 Step by Step: A Simple Guide and Reference* (13th Edition), Pearson, 2013 ISBN 9780205985517

Heyward VH and Gibson AL, *Advanced Fitness Assessment and Exercise Prescription* (Seventh Edition), Human Kinetics, 2014 ISBN 9781450466004

Heyward VH and Stolarczyk LM, *Applied Body Composition Assessment*, Human Kinetics, 1996 ISBN 9780873226530

Kent M, *Oxford Dictionary of Sports Science and Medicine* (Third Edition), Oxford University Press, 2007 ISBN 9780199210893

Maud PJ and Foster C, *Physiological Assessment of Human Fitness*, Human Kinetics, 2005 ISBN 9780736046336

Reiman MP and Manske RC, *Functional Testing in Human Performance: 139 Tests for Sport, Fitness, and Occupational Settings*, Human Kinetics, 2009 ISBN 9780736068796

Stafford-Brown et al *BTEC Level 3 National Sport and Exercise Sciences* (Fourth Edition), Hodder Education, 2016 ISBN 9781471878633

Thomas JR, Silverman SJ and Nelson JK, *Research Methods in Physical Activity* (Seventh Edition), Human Kinetics, 2015 ISBN 9781450470445

Walker I, *Research Methods and Statistics*, Palgrave MacMillan, 2010 ISBN 9780230249882

Websites

www.acsm.org – American College of Sports Medicine – An internationally recognised, dedicated, advanced sports medicine and sports science organisation. Supports learners with educational factsheets, and guidance to develop their future career.

www.bases.org.uk – British Association of Sport and Exercise Sciences – The professional body for promoting sport and exercise sciences in the UK. It promotes the delivery of professional standards and excellence in sport and exercise, representing its interests nationally and internationally.

www.brianmac.co.uk – a range of resources on, fitness testing, training, programming.

www.humankinetics.com – Human Kinetics – An international publishing organisation, offering a wide range of resources that are learner focused.

www.sportscoachuk.org – Sports Coach UK – A nationally recognised organisation that promotes the delivery of coaching, and the development of a coaching forum. Offers a range of resources for coaches that may be supportive to an aspiring sports scientist.

www.sportsci.org – Sport Science – An academic website that publishes the latest journals as well as published research and study guidance on a range of subject areas, including sports medicine, technology, training performance and statistics.

www.topendsports.com – Top end Sports – a range of resources on fitness testing, fitness training and nutrition.

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Unit 5: Applied Research Methods in Sport and Exercise Science

Delivery guidance

Approaching the unit

The overall aim of this unit is to introduce learners to the role of research in sports and exercise sciences and to develop practical skills in the use of research methods in sporting environments. Consequently, this unit is best delivered in a practical manner, using a series of mini-investigations that will allow learners to develop appropriate skills in the use of research methods.

Delivering the learning aims

Learning aim A

This learning aim centres on helping learners to develop an appreciation of the value of research in sporting environments and the different types of research carried out. This is important and should be afforded attention in the delivery, as understanding the relevance of research in a sports science context is often a challenge for learners. It is helpful to begin by gauging the learners' level of understanding of the concept of research in general (e.g. questions such as 'What do you think research is?' could be a good starting point for this).

When delivering this learning aim, the use of enquiry-led learning techniques may help learners to become more inquisitive and appreciative of the use and importance of research within the different aspects of sport. For example, you could use questions such as, 'Have you ever wondered how an athlete can improve their sprinting performance?' or 'Have you considered how athletes with different disabilities can enhance their sports techniques?'. This type of questioning should lead to a group discussion and can be a precursor to the use of different problem-based learning. Teaching should focus the importance of research and evidence-based practice to inform work with clients.

Learning aim B

This learning aim encourages learners to appreciate different factors that can affect the quality and effectiveness of research. Delivery of this learning aim lends itself heavily to enquiry-led learning, case-based learning and discussion activities that can be used to help learners appreciate the different factors that affect the effectiveness of research. Discussions could be tutor-led in the first instance (e.g. providing specific instances of projects with flawed methods and leading a discussion about why those methods are flawed) before using more learner-led, enquiry-led and case-based learning. These activities will help to give a context for learners to relate information to sport, thus helping them learn in a more applied manner. Providing this progression is likely to facilitate the learners' transition through assessment and grading criteria.

Learning aim C

This learning aim examines the three main approaches to research in the sport and exercise sciences (quantitative research, qualitative research and mixed-methods research). Throughout this learning aim, learners should develop an understanding of when each method should be used and should use the methods in practical settings in order to develop their practical research skills. Learners should be given the opportunity to look through examples of sports science projects which have used mixed-methods research. Learners should focus on research where the researcher has, for example, collected data using a quantitative data instrument, then followed this up by interviewing

a subset of the participants/sports people to learn more detailed information about some of the survey responses.

Learning aim D

This learning aim helps learners develop their practical skills in the use of research methods. It should be delivered through a series of simple mini-investigations in class that will allow learners to develop a skillset, rather than simply knowledge, of when different research methods could be used.

Examples of mini-investigations could include:

- 'The effects of different modes of stretching on hamstring flexibility' to allow learners to develop skills in quantitative data collection and analysis methods.
- Investigate the groups' attitudes towards a contemporary issue in sport to enable learners to develop skills in qualitative data collection and analysis.

Assessment model (in internally assessed units)

Learning aim	Key content areas	Recommended assessment approach
A Understand the importance of research in sporting environments	**A1** Introduction to research and the different types of research **A2** The importance of research for individuals involved in sport and exercise science **A3** The importance of using research to inform work with clients	A report that examines the importance of research when working with clients in sport-based settings and the key issues that affect the effectiveness of research.
B Examine key issues that impact on the effectiveness and quality of research in the sport and exercise sciences	**B1** Validity, reliability, accuracy and precision in research **B2** Ethical issues	
C Examine the three main approaches to research in the sport and exercise sciences	**C1** Quantitative research **C2** Qualitative research **C3** Mixed methods research	A presentation that introduces the main approaches to research in sport and exercise sciences and then presents the methods and results from an in-class mini investigation.
D Apply appropriate research methods to a selected sport and exercise sciences-based research problem	**D1** Quantitative research designs **D2** Quantitative data collection methods **D3** Quantitative data analysis methods **D4** Qualitative research designs **D5** Qualitative data collection methods **D6** Qualitative data analysis methods **D7** Mixed-research designs	

	D8 Mixed-research data collection **D9** Mixed-research data analysis	

Assessment guidance

The unit assessments should give learners scope to consider both the concepts and applications associated with the use of research methods in sports science. As such, the first assignment should encourage learners to use sport-based examples to contextualise their work throughout. This could include examining specific examples of factors affecting validity and reliability, as well as specific sport-based examples of different ethical issues in sport-based research. The second assignment should allow learners the flexibility to present a mini-investigation of their choice and should give sufficient scope for learners to think broadly around the topic to facilitate their justification of the selected research methods.

Both tutor and learners should provide appropriate live evidence of learners collecting data (e.g. video, annotated photographs, observation records), as well as appropriate live evidence (e.g. video or audio recording) of learners delivering their presentation.

Getting started

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

Unit 5: Applied Research Methods in Sport and Exercise Science

Introduction

Introduce the unit through discussions around the concept of research and the roles of research in modern-day sport and exercise (e.g. performance enhancement, improving health, investigating the benefits of different treatments). Learners could be asked to produce two spider diagrams for each of these topics (one for their understanding of the concept of research and the other for the roles of research) and then share these in group-based peer learning activities.

Learning aim A: Understand the importance of research in sporting environments

- The activities included in the unit introduction will benefit learners in their work towards learning aim A as they provide a platform for you to lead an introduction into different types of research and the importance of research.
- Following the overview of different types of research, you could use discussion activities with learners to help them examine where the different types of research are useful in a sport-based context. Learners could supplement this with independent and group-based research activities to explore the different uses of the different types of research and produce real-world examples of these.
- Once learners understand different types of research and when they are used, you could use debates to develop learners' understanding of the purpose of research. Discuss the importance of evidence-based practice when working with clients. This may also give an opportunity for learners to appreciate the relative, reciprocal merits of evidence-based practice and practice-based evidence.

Learning aim B: Examine key issues that impact on the effectiveness and quality of research in the sport and exercise sciences

- An introduction to this learning aim should outline the concepts of validity, reliability, accuracy and precision in research. It should give learners a foundation from which they can later apply those concepts. Using a combination of tutor-led activities (e.g. presentations), individual research tasks and discussion-based activities will help to develop knowledge of these key factors in the early stages.
- The work on research ethics may benefit from a constructivist approach to learning, whereby learners create different definitions and/or descriptions of the term 'ethics' before engaging in peer-led and tutor-facilitated discussions of how these may apply in sport and/or exercise contexts. Learners could produce examples of things that they see as ethical 'issues' and why they see these as such. Tutors could then give different realistic case-based scenarios, which learners could then appraise for ethical considerations. Example scenarios could include:
  - You have been invited to investigate agility test times in an under-16 girls' rugby club.
  - You want to investigate the effects of different energy gels on multi-stage fitness test performance.
  - You want to learn more about coach behaviours in different sport settings. A supervisor has suggested it could be a good idea not to inform the coaches about the real purpose of the study.
- Once learners are familiar with the importance of research within sport and the different factors that can affect the success of projects, you could use more enquiry-led or case-based learning activities to help learners apply these to sporting

examples. An example of a research scenario and critical thinking questions for enquiry-led/case-based learning are as follows:

- Imagine you are conducting a research project looking at public opinions of player performance in cricket. What are the different factors that could impact on the quality and effectiveness of the research? What are the different ethical issues that could be associated with a project like this?

- To introduce learners to the concepts of validity, reliability, accuracy and precision, you could utilise a practical investigation. Some examples could be:
  - Using skinfold callipers to assess body composition in student athletes.
  - The benefits of a short imagery training intervention on bullseye success in darts.

Learning aim C: Examine the three main approaches to research in the sport and exercise sciences

- Throughout this learning aim, learners should use different research methods in practical settings in order to develop their practical skills in using the methods, as opposed to simply understanding when to use them.
- It will be useful for learners to look at examples of quantitative research. For example, data collected from previous sports science research projects, data collected from learners recording patterns of play in a football match, or data collected from examining techniques used by a bowler in cricket. Learners should consider the strengths and weaknesses of quantitative research.
- Learners must also explore the benefits and drawbacks of using qualitative research in sports science. Learners should use the internet to find out about this type pf research, how it produces non-numerical data and can be used well with smaller groups.
- It will be useful for learners to study examples of qualitative research. For example, data collected from previous sports science research projects, data collected from learners recording observations made whilst watching an athlete perform in a 4x100m relay, or data collected from observing a centre player in netball during a competitive match.
- Learners could take part in a visit to a local university with a sports science research area or a major sports club to observe examples of qualitative research. During the visit learners should identify different research methods in use.
- Learners could focus on research where the researcher has collected data using a quantitative data instrument, then follow this up by interviewing a subset of the participants to learn more detailed information about some of the survey responses.
- To support the learners' development of practical research skills they must be given the opportunity to carry out quantitative, qualitative and mixed-methods research in practical settings to enable them to develop their practical skills in using these methods.

Learning aim D: Apply appropriate research methods to a selected sport and exercise sciences-based research problem

- This learning aim is best delivered through practical mini-investigations. On a weekly basis, learners could be given a different mini-investigation title and then use appropriate data collection and analysis methods to complete the mini-investigation. The investigations should cover the breadth and depth of the unit content (research designs, data collection, data analysis and the preceding learning aims) and should be of sufficient scope to allow learners to develop their problem-solving skills. Example investigations could be:
  - What are the differences in sit and reach test results in males and females?

- Is there a relationship between support foot placement and penalty kick speed in football?
- What are further education learners' opinions of sport and exercise provision in their locality?
- How does an injured athlete perceive that they are psychologically ready to return to competition?

- It would be worthwhile to use activities that will allow learners to explore the different potential research methods that could be used to complete the mini-investigation to help them to develop their critical thinking and exploration skills.

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

This unit links to:

- Unit 4: Field and Laboratory-based Fitness Testing
- Unit 9: Research Project in Sport and Exercise Science.

Resources

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

Textbooks

Adams M et al, *BTEC Level 3 National Sport and Exercise Sciences – Student Book*, Pearson, 2016 ISBN 9781292133959

Gratton C and Jones I, *Research Methods for Sports Studies*, Second Edition (Routledge, 2010) ISBN 9780415493932 – useful textbook on research methods that will provide a helpful overview of many of the topics included in this unit.

Pitney WA and Parker J, *Qualitative Research in Physical Activity and the Health Professions* (Human Kinetics, 2009) ISBN 9780736072137 – useful textbook on qualitative research.

Stafford-Brown J et al, *BTEC Level 3 National Sport and Exercise Sciences* (Fourth Edition), Hodder Education, 2016 ISBN 9781471878633

Journals

Qualitative Research in Sport, Exercise and Health (Taylor & Francis) – publishes different articles on qualitative research in sport, exercise and health.

Websites

http://www.bases.org.uk/write/Documents/BASES_Code_of_Conduct_(3).docx – The British Association of Sport and Exercise Science's Code of Conduct, which outlines different ethical considerations associated with research and professional practice.

http://www.bases.org.uk/Ethics-and-Participation-in-Research-of-Young-People – The British Association of Sport and Exercise Science's expert statement on ethics and participation in research of young people, which outlines ethical issues unique to research with children and young people.

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.

Unit 6: Coaching for Performance and Fitness

Delivery guidance

Approaching the unit

This unit is an introduction to sports performance coaching. The emphasis is on the role of a coach in developing and improving an athlete's performance by enhancing technical and tactical performance, and developing their sport-related fitness. To develop learners' understanding of performance coaching, it is important that you cover the skills, qualities and responsibilities of leaders through a range of theoretical and practical methods. You should also refer to progression through the performance pathway.

You could introduce learners to coaches across a range of sports and the UKCC (UK Coaching Certificate) coaching framework. This will help your learners to develop an understanding of the roles that sports performance coaches perform, and the guidelines and standards within which they operate. Encourage learners to review other sports, while establishing an ideal model for the performance coach in their chosen specialist sport. Throughout the delivery of this unit, highlight examples of good practice in performance coaching and encourage discussion of the core roles, responsibilities, skills and qualities of a coach and how these relate to safety, athlete development, and short- and long-term success.

You should give learners the opportunity to experience practically a range of drills, practices and training methods and technologies from different sports, and encourage them to research and gain experience with local sports clubs and coaches. This broad experience should be distilled into the learners' development of practices and training plan in their own sport. Learners could devise coaching sessions, practices and fitness training to deliver to each other, while developing reflection and evaluation skills through peer review.

Delivering the learning aims

Learning aim A

For learning aim A, you could introduce the concept of coaching for performance early in the course; this could be modelled by you and through observation of other coaches. You could introduce these ideas and methods to learners in a practical environment. Learners could develop understanding of the skills, knowledge, qualities and best practice required for coaching for performance, by observing coaches and participating in coached sessions led by you, other coaches or each other. Learners could support this by research into coaching best practice and reference to UKCC and Register of Exercise Professionals (REPs) guidelines for level 1 and 2 coaches. Emphasis throughout must be placed on the development of athletes' performance through coaching behaviours, analysis and feedback.

Job specifications for talent coach and strength and conditioning coach roles can be researched on national governing body (NGB) and Sports England REPs websites. Learners could review a range of sports and develop an ideal model for

their own sport. You could encourage learners to identify generic and sport-specific skills, knowledge, qualities and best practice required for coaching for performance. Evaluation of required and desired traits within the specification will give a deeper understanding of the role. Throughout the delivery of this unit, you should encourage learners to reflect on their strengths and areas for improvement in how they meet the skills, knowledge, qualities and best practice required for coaching for performance in their sport.

Learners should identify and evaluate the technological tools and collaborative partnerships used by effective coaches. In their observations and analysis of practicing coaches, they should focus on the equipment and technology used and how it may enhance the coach's work and development of the athlete. Learners should review any limitations of cost, access, accuracy and validity.

Direct your learners to review the use of other professionals, such as therapists, strength and conditioning coaches and psychologists. The coach managing an athletes' development should take a holistic view about how these professionals can aid the development of an athlete.

Learning aim B

Learning aim B focuses on learners developing their knowledge of practices and drills to develop the performance of skills, techniques, tactics and fitness in their chosen sport. Learners should experience a wide range of drills, practices and training methods from their own and other sports, which can be delivered by you, sports coaches or their peers. This is an opportunity to invite talent coaches from local clubs and NGBs. Give learners the opportunity to develop their coaching behaviour through delivering practices from their sport to their peers. This may be a good time to introduce elements of learning aim C, the planning of sessions, although you need not expect your learners to deliver whole sessions at this point.

The emphasis of drills and practices should be on developing the performance of skills, techniques, tactics and relevant components of fitness within the learners' sports. Ask learners to adapt their drills and the drills from other sports, to further challenge and develop the performance of the athletes. Encourage learners to make the practices assimilate the physical and psychological demands of the sport in which they are preparing athletes to perform.

To support the development of their coaching, learners should identify, analyse and adapt methods of evaluating athlete performance. These measures should be used to evaluate training and establish future targets for athlete development. Learners must experience administering a range of tests to evaluate effectively what works for them as a coach in their sport.

Learning aim C

Learning aim C builds on the drills and practices that learners have developed. Learners should move to placing these drills and practices in a coherent progressive session and a series of sessions to promote the development of athletes' skills, technical and tactical, and fitness performance. Learners can be asked what information they would require before planning to coach an athlete or a team. This can be a class discussion with ideas harvested from the group, guided by you, to ensure that the essential content is covered.

Learners could be given and research a range of formats for planning sessions. You should emphasise the development of athlete performance and the progressive nature of the sessions' plans. Where possible, encourage learners to deliver and review their sessions and those of their peers, to develop their planning, delivery and review skills. You could use scenarios to contextualise

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planning or real-life opportunities to assist at clubs, in extracurricular activities or with their teaching group. Scenarios can be developed to include a target event for a series of sessions. Learners should look at the planning process by starting at the end point and taking logical steps back to establish how athletes' performance can be developed towards the series end goal. Links between the individual session and its place within the overall plan need to be discussed and alternatives considered.

Learning aim D

Learners should now apply all they have learned throughout the unit to the delivery and review of their coaching for performance. Learners should develop the ability to review and action plan through practical experience. You should give the learners opportunities to deliver sessions with their peer group at the local club or in the community; this could be part of a work experience. The coaching sessions should be videoed to allow learners to reflect on their coaching delivery. The sessions must be safe and focus on the development of the athletes' skills and technical and tactical performance. Once delivered, learners can watch the video and gather information on the session through peer review and by asking you targeted questions. You should direct learners to review elements covered in the unit content, including athlete development, and cause and effect within the session. They should ask how their planning, practices and coaching affected the progress, positively or negatively, during the session.

Encourage learners to be reflective in their practice. After coaching episodes, learners should engage in discussion and review, drawing conclusions about the extent to which the session fulfilled its aims and the development of the practices, and their continuing personal development as a coach.

Learning aim	Key content areas	Recommended assessment approach
A Investigate coaching for performance and fitness	**A1** Skills and knowledge for coaching for performance and fitness **A2** Qualities for coaching for performance and fitness **A3** Best practice for a coach for performance and fitness **A4** Methods of supporting the development of performance and fitness **A5** Technology and sports professionals	A job description for a performance-coaching role that details skills, qualities and best practices of a performance coach A report reflecting own current coaching performance against the job description
B Explore practices, methods and measures used to develop performance and fitness	**B1** Practices to develop skills and techniques for performance **B2** Practices to develop tactics for performance **B3** Adaptation of practices to promote development of performance and fitness **B4** Measures of	Coaching resources that detail practices, benchmarks and field tests that will develop fitness, skills, techniques and tactics for performance A report that assesses the practicality, suitability and effectiveness of the practices, suggesting

	performance and fitness	adaptations
C Demonstrate effective planning of coaching to develop performance and fitness	**C1** Planning considerations **C2** Planning for an individual session for performance and fitness **C3** Planning for an overall series of sessions for performance and fitness	A coaching plan that details safe working coaching practices that develop performance, reflected in a series of coaching sessions A video of the delivered coaching session based on the coaching plan A report reflecting on the planning, delivery and impact of own coaching performance
D Explore the impact of coaching for performance and fitness	**D1** Delivering for coaching performance and fitness **D2** Reflection on session and planned series **D3** Coaching development based on reflection	

Assessment guidance

It is recommended that you follow the suggested assignment format detailed in the unit specification.

Learners should have practical experience of a range of sports and different coaches, to gain an awareness of coaching techniques, coaching methods and how professional coaches perform their job.

They should then research specific skills, knowledge, qualities and best practice required for coaching for performance in their own sport. This should be supported by relevant sources, such as coaching manuals and NGB coaching awards as part of the UKCC framework.

Assignment 1 may be presented as a job specification, and learners could look at the different formats that are used by sporting organisations. The report could be written or could be a verbally presented reflection with audio or video evidence.

Assignment 2 draws together learners' experiences and research into the delivery of skills and tactics in their own sport, to produce a resource of coaching practices that could be used as reference material by other coaches in their sport. Practices should be presented in a format that would allow another coach to replicate the experience of the learners' athletes. This could be in a written format, illustrated with diagrams or a video. Research, planning and action plans could be delivered in written formats, with relevant citations included. These practices should be evaluated and justified, stating their strengths and weaknesses, and ways in which they could be adapted to ensure the achievement of a session goal and also the development of athletes' performances.

For Assignment 3, learners plan, deliver and evaluate a session plan, which will develop athletes' performances. This unit is practical in its focus. Therefore, there are opportunities for evidence to be presented in a range of formats, including written, illustrated, photographs or video. Learners may produce evidence in practical settings within the community and could gather suitable evidence for assessment such as videoing the coaching of a local youth team, supported by an authenticated observation record. Assessors must be able to review both the performance and the validity and accuracy of the learners'

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review of their coaching. Learners could provide evidence for review of coaching performance in a written format or through an oral or a visual report.

Getting started

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

Unit 6: Coaching for Performance and Fitness

Introduction

As a starting point, you will find it very useful to introduce learners to the concepts of coaching for performance, including the development of technical and tactical components and relevant sport-related fitness. Coaches for performance aim to develop and enhance the performance of athletes. In order to be successful, they will need to have a thorough understanding of the skills, knowledge, qualities and best practice required for coaching for performance.

Throughout the delivery of this unit, you should encourage learners to reflect on their performance and share peer review of coaching maturely. Learners should also keep a coaching diary throughout the unit to review their own coaching experiences and identify strengths and areas for improvement.

Learning aim A – Investigate coaching for performance and fitness

- Introduce this learning aim by asking learners to reflect on the coaching they have experienced. What do they think makes a good and effective coach? Some of your learners may also have first-hand experience of coaching, so it would be useful to discover their prior knowledge, experience and understanding of the role. Throughout the delivery of the activities in this learning aim, learners should be encouraged to reflect on how their personal skills, knowledge and qualities meet the role of a coach for performance, identifying strengths, weaknesses and areas for improvement. They should also make notes towards a coaching action plan.
- Working individually or in small groups, learners create a poster that details the skills and qualities a coach should have. Individuals/groups can then feed back their findings to the rest of the class. You should record their responses (on a flipchart/whiteboard) and be prepared to prompt learners if they have overlooked any skills/qualities. At this point, you could invite guest speakers from the county sports partnerships, professional coaches and NGBs to explain their jobs and the skills, qualities, knowledge and qualifications needed to fulfil their roles. If guest speakers are unavailable, learners could observe a range of coaches from different levels and from their own and other sports. This can be in person or on video. Alternatively, you could deliver a model session focusing on performance.
- Ask learners to identify whether the coaches are coaching for performance or to encourage participation. Challenge the learners to identify and note the skills, qualities, knowledge and best practice evidenced and required to produce the session. Learners should then reflect on the performance of the coaches observed, noting the skills, knowledge and best practice used in delivering the performance-focused session.
- In order to have some additional information with which to compare their observations of coaches, you should task learners with researching UKCC and NGB coaching frameworks to identify the skills, knowledge and qualities of a coach. Learners should also research online to find job advertisements/descriptions for coaching positions. Alternatively, you could give learners a selection of advertisements.
- During observation and research into the delivery methods of different coaches, the use of technology should be noted and evaluated for its contribution to the coaches'

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work, and feasibility of its use by different coaches – based on cost, access and usability.

- To introduce learners to the assessment requirements, guide a discussion that covers the unit content for learning aims A1 and A2, in the recommended assignments. The discussion should guide learners through the key content areas and introduce the recommended assessment approach. When learners have completed their research, ask them to reflect on how it compares to their own observations and evaluations of coaches. Learners could identify common traits, and essential and desired requirements and, in small groups, write an agreed specification for a sports performance coach. Ideally, these groups would be sport-specific, so that work is not duplicated.
- Individually, learners should then reflect on their research to write a model of skills, qualities, knowledge and best practice for a coach for performance in their chosen sport. This could be by means of a structured template that learners use as a self-evaluation tool when reflecting on their own practice and the practice of other performance coaches, identifying strengths, weaknesses and areas for improvement.
- Working in small groups, learners should research the role of different supporting professionals and how that aids the development of an athlete or a team and then present their findings for discussion. The contribution of the supporting professionals identified in learning aim A5 needs to be evaluated according to access, cost and effective contribution to an athlete's development.
- Professionals from local supporting industries can be invited to explain to learners what they do and how they support sports coaches and athletes in what they do.
- To complete the activities for this learning aim, guide a discussion that covers the unit content for learning aims A3 and A4 in the recommended assignments, drawing together the various topics. The discussion should guide the learners through the key content areas and introduce the recommended assessment approach.

Learning aim B – Explore practices, methods and measures used to develop performance and fitness

- You will find it very useful to ensure that the delivery of activities in learning aim B is as practical and interactive as possible. Learners should experience drills and practices from a range of sports, reflect on them and adapt them to their own sport.
- Introduce this learning aim by delivering a sample session of drills and practices to improve athletes' performance in a range of sports. Initially, the focus of the drills, practices and delivery must be on improving technical performance. Drills/practices should include and progress the techniques through the following:
  - isolated drills/practices
  - conditioned situations
  - competitive situations – offensive and defensive.
- If possible, invite specialist coaches from NGBs and sports partnerships to deliver sessions and explain how they progress an athlete's performance. Strength and conditioning coaches and personal trainers are also good sources of industry insight. Alternatively, you may be able to arrange visits to local sports organisations.
- Using the variables identified in learning aim B3, task the learners with making adaptations and progressions to the drills and practices, to challenge and promote improvement in technical performance. Learners should then review and adapt the

drills and practices to their own sport, and carry out independent research and preparation to plan drills and practices to deliver to their peers.

- When their planning is complete, ensure that learners have the opportunity to deliver drills and practices in their chosen sport to their peers or to other groups of learners.
- At the completion of this activity, lead a discussion with the learners reviewing drills and practices according to practicality, suitability and effectiveness, and suggesting adaptations and progressions. You may wish to follow this up with individual feedback.
- You can follow the process outlined above when moving the focus of the drills, practices and delivery to improving tactical performance.
- Ask learners how coaches can measure performance and fitness and how these measures are benchmarked.
- Learners should research benchmarks and measurements, in relation to their sport and present their findings to the rest of the class. Peers review the measures and identify adaptations that may make them more effective or useful to other sports.
- At the completion of these activities, demonstrate methods of recording or presenting drills and practices for others to replicate, such as numbered instructions, diagrams, photographs and videos. You should then ask learners to begin considering which method or methods would be most appropriate for their chosen sport and their style of delivery.

Learning aim C – Demonstrate effective planning of coaching to develop performance and fitness

- You may find it useful to have examples of pre-activity questionnaires, parental consent forms and session planning templates, which the learners could review. Alternatively, learners could be asked either to research these online or to visit local sporting organisations to collect examples.
- Introduce this learning aim by leading a discussion on 'Why is planning important?' You should guide the discussion so that it covers the points outlined in learning aim C1. Alternatively, you could ask learners individually, or in small groups, to create a spider diagram of the range and types of information they might take into consideration when planning a coaching session, asking the question 'What essential information is required before planning sessions?' Using this information, learners could then have small group discussions, or you could lead a whole class discussion, on why the answers to their questions are important and how not having the information could affect their planning.
- In small groups, learners then review a range of pre-activity questionnaires and parental consent forms. At the conclusion of this activity, groups devise a class agreed pre-activity questionnaire and a parental consent form, which learners would use when planning their coaching sessions. These would also be useful evidence of successful completion of this part of the learning aim.
- For the next part of the learning aim, you may find it useful to deliver a model coaching session, focusing on the points covered in learning aim C2. Alternatively, you could invite a local coach to deliver the session or arrange a visit to a local sporting organisation to see coaching sessions. At the completion of the model coaching session, facilitate a group discussion on what activities were included in each part, why they are important and the duration of each part, ensuring that the progression points in learning aim C2 are fully covered.
- Once you are satisfied that learners are fully aware of all the planning considerations required, as outlined in learning aims C1 and C2, learners should plan a coaching session. In order to do this, they will need access to a range of

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templates for planning coaching sessions, which you should provide; you can use lesson plans or templates from NGB coaching awards and Sports Coach UK guidance. Working in small groups, learners should agree on a session planning template and plan a coaching session. You may then find it beneficial to specify the extent of the parameters that learners should work within, e.g., each group is given a different group of participants (based on age/ability/individual needs etc) and a different environment in which to run an activity. Each group presents to the whole class what kind of session they would run and why. Consideration must be given as to how the sessions will be affected by the information gathered in learning aim C1.

- Following feedback and any changes thought necessary as a result of it, the same groups of learners work to plan a session, with each learner delivering a different part of the session to the rest of the learners – e.g., one taking intro/warm-up, another taking technique and tactics, and another taking adaptations, cool-down and feedback. The activity could run over a few weeks, so each group could run a session. Alternatively, and depending on your judgement of their progress, learners could work independently and deliver their session to the whole class or to groups of other learners, if this could be arranged either at your centre or at other local education establishments. At the completion of this activity, you should give individual learners feedback, which should focus on the planning and delivery of their coaching session.
- When learners have adequately demonstrated their competence in planning and delivering a coaching session, they should move on to planning a series of coaching sessions (learning aim C3). You will need to outline the different formats for the planning of a series of sessions:
  - development of different skills and techniques combined
  - development of a selected technique
  - development of tactical application.
- You will also find it useful to explain different aims and targets for the series of coaching sessions. Learners could work in groups, with learners specialising in the same sport producing an outline plan for a series of sessions that build towards an agreed end goal. Learners should be encouraged to research their sport online and by using coaching materials. Learners should clearly identify different events or process aims and targets that they could work towards; this could be participation in an event or development of a performance goal. If there are a number of learners from the same sport, then more than one group can produce a plan. Alternatively, and once again depending on your judgement of their progress, learners could work independently. Learners should then present their plan to the group for review and justification of their decisions.

Learning aim D – Explore the impact of coaching for performance and fitness

- Central to this learning aim is the requirement that learners coach a sporting performance session. You should attempt to provide a range of delivery options: learners could coach their peers or coach in their community (as part of work experience, within school clubs with younger pupils or at their own sports clubs).
- Once a coaching group has been identified, learners should follow the processes established in learning aims B and C, and plan a set of coaching sessions accordingly. It will be beneficial if learners are able to work with their groups before a session is video recorded. This will give them the opportunity to get to know the athletes in the group, refine their delivery, reflect on their practice and make any necessary changes.
- Before beginning the set of coaching sessions, learners will need to decide how the coaching sessions will be reviewed/evaluated. You may find it useful to lead a whole

class discussion, which identifies sources of information that can be used to review sessions such as peer review, tutor observation, athletes' feedback and self-reflection. You will also need to discuss the key performance indicators around which the review will be built, e.g., planning, organisation, awareness of health and safety, content of the session, leadership style, coaching communication, demonstrations, observation and correction of performance, achievement of the session objectives – essentially the skills, qualities, knowledge and best practice of a coach and athlete performance.

- Once the criteria have been decided, learners should produce a success criteria template, which can be used by learners, tutors, athletes and others who may observe the coaching session, in order to rate their skills and identify strengths and areas for improvement. Learners could be directed to complete this before the start of their set of coaching sessions, and then complete it again at the end of every session. Learners could then use these completed reviews/evaluations as evidence of reflective practice, and for improving their approaches to subsequent sessions.
- You should carry out coaching session observations and reviews of learners' coaching, indicating strengths and areas for improvement. You should also organise peer and performer feedback, which can be used to inform the learners' coaching diary and development actions.
- When reflecting on the delivery of their sessions and writing their concluding report, learners should be able to make a clear link between planning, delivery, coaching behaviours and the impact of their coaching performance. Using all the available sources of information, they should also be able to make personal and session development recommendations (as outlined in learning aim D3), identifying strengths, areas for improvement and further development.

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

Several other units from this qualification complement this unit. These include:

- Unit 2: Functional Anatomy
- Unit 3: Applied Sport and Exercise Psychology
- Unit 4: Field- and Laboratory-based Testing
- Unit 7: Biomechanics in Sport and Exercise Science
- Unit 8: Specialised Fitness Training
- Unit 10: Physical Activity for Individual and Group-based Exercise
- Unit 11: Sports Massage
- Unit 13: Nutrition for Sport and Exercise Performance
- Unit 14: Technology in Sport and Exercise Science
- Unit 15: Sports Injury and Assessment

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Sport and Exercise Science. Check the Pearson website (http://qualifications.pearson.com/en/support/published-resources.html) for more information as titles achieve endorsement.

Textbooks

Adams M et al, *BTEC Level 3 National Sport and Exercise Sciences* – Student Book, Pearson, 2016 ISBN 9781292133959

Armour K, *Sport Pedagogy: An Introduction for Teaching and Coaching*, Routledge, 2011 ISBN 9780273732587 – The book offers theoretical and practical guidance for those studying to become an effective teacher or coach, and for anyone who wants to inspire children and young people to engage in and enjoy sport for life.

Bush A et al, *Foundations in Sports Coaching*, Heinemann, 2012 ISBN 9780435046842 – This textbook provides all the core content for sports coaching.

Cassidy T et al, *Understanding Sports Coaching: The Pedagogical, Social and Cultural Foundations of Coaching Practice*, Routledge, 2015 ISBN 9780415857475 – This book provides an introduction to theory and practice in sports coaching and fully explores the social, cultural and pedagogical concepts underpinning good coaching practice.

Hackett P and Hackett S, *Creating a Safe Coaching Environment*, Coachwise Ltd, 2004 ISBN 9781902523743 – Information for learners about creating a safe coaching environment. This book aims to help coaches minimise the risks to their athletes and to protect them. It includes sample risk assessment forms and information on how to create a safe coaching environment, legislation, health and safety, negligence and duty of care.

Lyle J, *Sports Coaching Concepts: A Framework for Coaches' Behaviour*, Routledge, 2002 ISBN 9780415261586 – A comprehensive introduction to the conceptual issues that underpin sports coaching practice. This book provides a complete conceptual framework for understanding sports coaching.

Lyle J and Cushion C, *Sports Coaching: Professionalisation and Practice*, Churchill Livingstone, 2010 ISBN 9780702030543 – This book deals with all aspects of coaching behaviour and practice, including coaches' decision making, coaching pedagogy and the development of expertise.

Nash C, *Practical Sports Coaching*, Routledge, 2014 ISBN 9781444176704 – Drawing on real-life case studies and examples, this book is designed to develop practical coaching skills and gives learners the methods and tools they need to become an expert coach.

Robinson PE, *Foundations of Sports Coaching*, Routledge, 2014 ISBN 9780415749251 – This book aims to give learners all the skills, knowledge and scientific background they will need to prepare athletes and sports people technically, tactically, physically and mentally.

Sports Coach UK, *Coaching Sessions: A Guide to Planning and Goal-setting*, 1st4Sport.com, 1996 ISBN 978094785035x – This resource will help learners to plan individual sessions and set targets to meet their performers' needs.

Sports Coach UK, *First Steps into Coaching*, 1st4Sport.com, 2012 ISBN 9781905540952 – This resource will give learners the information they need to take their first steps into coaching.

Sports Coach UK, *How to Deliver Engaging Sessions*, 1st4Sport.com, 2012, product code B12066 – Each section of this book has thought-provoking questions for learners to consider through using self-reflection and diagnosis of their own methods.

Stafford-Brown J et al, *BTEC Level 3 National Sport and Exercise Sciences*(Fourth Edition), Hodder Education, 2016 ISBN 9781471878633

Thompson P, *Introduction to Coaching*, Meyer & Meyer Sport (UK) Ltd, 2009 ISBN 9781841262581 – The official guide to coaching theory from the IAAF.

Various authors, *Know the Game* series, A&C Black, various dates – Each book contains everything learners need to know about that sport, including equipment, rules, techniques and training tips. Each book is endorsed by the relevant sport's professional body.

Journals

Coaching Edge Magazine (Sports Coach UK) – Produced quarterly, includes top coaches outlining their innovative coaching methods, tried and tested theories to improve coaching, how sports science can make a real difference and well-presented technical information, with something for every coach or sports enthusiast no matter what their level of experience.

Websites

The following NGB websites (the list is not exhaustive) contain information regarding coaching materials and coaching practice. Some websites may link to others that have further information.

www.badmintonengland.co.uk – Badminton England

www.britishathletics.org.uk – UK Athletics

www.britishcycling.org.uk – British Cycling

www.british-gymnastics.org.uk – British Gymnastics

www.britishswimming.org – Amateur Swimming Association

www.ecb.co.uk/ – English Cricket Board

www.englandbasketball.co.uk – English Basketball Association

www.lta.org.uk – The Lawn Tennis Association

www.olympic.org.uk – The British Olympic Association

www.rfu.com – The Rugby Football Union

http://tabletennisengland.co.uk/ – England Table Tennis

www.thefa.com – The Football Association

www.therfl.co.uk – The Rugby Football League

Additional useful websites include:

www.1st4sport.com – Provides resources for sports coaching, training and physical education.

www.academysoccercoach.co.uk/ – This website is regarded as an essential resource for soccer coaches and players, as well as for many others working within football education and development across the world.

www.breakthroughbasketball.com – Monthly newsletter with tips, tactics and strategies for basketball coaches.

www.brianmac.co.uk/ – Sports Coach provides information about the many topics related to developing a healthy physical and mental condition to help fitness enthusiasts, athletes and coaches achieve their goals and to assist learners studying sport-related qualifications.

www.coachwise.ltd.uk – Provides assistance to organisations developing sports participation, coaching and talent programmes.

http://news.bbc.co.uk/sportacademy – BBC Sport Academy – Advice on technique for different sports.

www.safesport.co.uk – Offers a unique reference point on playing sport safely.

www.sportscoachuk.org – The UK's technical agency for coaching, established for public benefit to promote the education of sports coaches, youth and community sports leaders, physical education teachers and other people engaged in the teaching and encouragement of sporting skills in the fields of physiology, biomechanics, psychology, sociology, philosophy and other sports-related subjects.

Unit 7: Biomechanics in Sport and Exercise Science

Delivery guidance

Approaching the unit

This unit is designed to introduce learners to the biomechanics of sport and exercise and it presents key concepts central to the understanding of biomechanics. You should encourage learners to find out information for themselves, and to consider how the concepts and theories help them to understand their own performance in sport and exercise. The practical focus of the unit enables learners to see biomechanics in action and develop a greater appreciation of the concepts. While you will have to present some of the theory to learners, the focus should be on learners working both independently and in groups to develop their own understanding of the concepts.

The practical and theoretical activities will not only contribute to learners' understanding but also prepare them for the demands of assessment.

While each topic has its own discrete content, there are links between topics as they all deal with the movement of athletes and sporting equipment in sport and exercise environments.

Delivering the learning aims

Learning aim A

When delivering learning aim A, it is important to base the work in a practical environment. This will enable learners to understand the application of biomechanical principles to their own sports performance, rather than it being a purely theoretical subject. Learners can collect data that they can use to calculate speed, velocity and acceleration.

This learning aim offers opportunities for learners to work in pairs and small groups, with your direction, to investigate concepts within linear motion. Learners can consider the types of motion that athletes and their sporting equipment will produce, and the forces that impact on their motion.

This learning aim also offers opportunities for learners to investigate concepts individually, such as acceleration and deceleration, through research using textbooks and online resources.

In all learning aims, it is important to stress the practical applications of biomechanical concepts, which is a key focus of the assessment tasks.

Learning aim B

Learning aim B can be delivered in a similar way, with a focus on practical work. When delivering content on Newton's laws of motion, learners could develop sporting situations to show the laws of motion in practice. Otherwise, learners may find this topic overly theoretical and seemingly of limited relevance.

Other practical work can involve learners viewing video footage of biomechanical concepts in action, such as air resistance and aerodynamics. When teaching the Magnus effect, you could use specific learners to demonstrate examples of the effect in practice. If these skills are not available with the learner group, you could use video footage. When teaching lift, you could present video footage showing examples of when lift has an impact in sports.

You could use small group activities to enable learners to conduct their own research into practical applications of concepts of aerodynamics.

Learning aim C

Learning aim C can also focus on practical activities. You could present learners with different pieces of sporting equipment and ask them to assess the location of the equipment's centre of mass. To demonstrate the relationship between centre of mass and stability, you could ask learners to adopt different positions and then test them for stability.

When helping learners to understand the three axes of rotation, the tutor can demonstrate movement in the three axes and then guide learners as they find their own sporting examples of movement in each of the three axes.

The theoretical aspects of the learning aim can be explored through small group and independent activities that enable learners to do their own research into the application of these concepts.

Learning aim	Key content areas	Recommended assessment approach
A Investigate linear motion in sport and exercise activities	**A1** Linear motion **A2** Speed and velocity **A3** Acceleration and deceleration **A4** Inertia and momentum	A portfolio detailing an investigation into linear motion in sport and exercise science
B Examine forces acting on sports performers and their equipment	**B1** Newton's three laws of motion **B2** Reaction forces **B3** Friction **B4** Air resistance **B5** Aerodynamics **B6** Lift and Bernoulli's principle	A report that examines the forces acting on sports performers and their equipment
C Investigate angular motion in sport and exercise activities	**C1** Centre of mass **C2** Centre of mass and stability **C3** Levers **C4** Axes of rotation	A presentation that details an investigation into angular motion in sport and exercise activities

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Assessment guidance

This unit is internally assessed and consists of three assignments. To support the successful outcome of learners, assessment should build on the activities that the learners have engaged in during the teaching of each learning aim and could use the examples of sporting activities that they have been working on. Learners should be familiar with the key terms that will be used while assessing this unit.

Activities should introduce learners to appropriate resources for the theoretical aspects of their assignment, and enable learners to have resources to help them explain and analyse sporting activities.

It is recommended that you follow the suggested assignment format detailed in the unit specification.

Each assignment brief should employ a different method of assessment, and this unit lends itself well to learners developing a portfolio containing their research into the biomechanical basis of sport and exercise. This information could be developed into a presentation, using the visual resources that learners have developed through activities.

Learning aim A is to be assessed by a portfolio of resources that investigate the three content areas under linear motion. The first part of the portfolio should focus on speed and velocity and the difference between the two quantities. The second section should focus on acceleration and deceleration and the third section on inertia and momentum. The work needs to be backed up by examples from sport and exercise that illustrate the principles of linear motion in action.

Learning aim B will be assessed by a written report into the effect of forces on sport and exercise activities. The report should be structured into six sections, each one covering one of the content areas on the unit specification. Learners should analyse how forces impact on sport and exercise activities and how they affect sporting techniques and the design of sporting equipment. Learners will need to show that they understand Newton's three laws of motion and can give examples of how these laws work in practice and impact on sport and exercise activities. Learners should draw from a range of sport and exercise activities when giving examples of forces and their impact.

Learning aim C is to be assessed by a presentation. The presentation should have three parts to it with part 1 covering levers, part 2 covering the centre of mass and stability and part 3 the axes of rotation. Learners should be encouraged to use practical demonstrations, video footage and images as well as giving a PowerPoint presentation. The presentation should offer practical examples that show how the principles of motion apply to sport and exercise activities and can be seen in action.

Getting started

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

Unit 7: Biomechanics in Sport and Exercise Science

Introduction

Introduce the unit to learners by explaining the scope of biomechanics, and what research and application of biomechanical principles aim to achieve. It is vital to introduce it as a practical subject used by sport scientists to improve the performances of athletes. You should then outline the three learning aims to be covered and explain that the unit will be assessed internally, using a range of assessment methods.

You can give examples of the impact that biomechanics research has had on sports performance and then start teaching with a practical activity on speed, velocity and acceleration.

Biomechanics should be taught using practical experiments to illustrate theories, with the use of group activities to develop understanding of the theories. It is important to implement differentiation during the delivery process so that learning can take place in groups of mixed ability, and that independent learning is designed to meet the needs of learners of differing abilities.

Learning aim A: Investigate linear motion in sport and exercise activities

- Introduce the topic and content of learning aim A by explaining linear motion and the aspects of motion that will be covered.
- You can then introduce the main concepts of the learning aim and how they are calculated:
  - vector and scalar quantities
  - speed and velocity
  - acceleration and deceleration
  - inertia and momentum.
- Set up a practical experiment, involving learners, about speed and velocity. Divide the class into two groups; one group will be runners and the other group will be experimenters. Choose a 100-m straight and divide it up into 10-m segments; then use either timing gates or learners placed at 10-m intervals to record the times of the runners over the 100-m distance, and the distance to each of the timing gate/station. The times should be recorded and distributed to each learner. In small groups, learners work together to calculate:
  - speed and velocity for a selection of runners over each 10-m segment, and for the entire 100-m race
  - acceleration and deceleration of runners over each 10-m segment.
- Learners should discuss their findings and the differences between scalar and vector qualities.
- Learners should work together to find practical examples of biomechanical principles in action, such as examples of projectiles undergoing acceleration and deceleration. They should then select examples of inertia and momentum and

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assess the outcomes of these qualities.

Learning aim B: Examine forces acting on sports performers and their equipment

- Introduce the topic and content of learning aim B by explaining the meaning of forces and asking learners to consider the forces in action during sport and exercise. You should divide the forces into those that assist performance and those that impair performance.
- Use a small group activity to start learners thinking about and understanding Newton's laws of motion. Ask learners to research each of Newton's three laws of motion, and to present a poster illustrating each law and giving a clear explanation of it. Learners should use sport and exercise examples so that the application of each law is evident.
- Involve learners in a practical activity to illustrate Newton's three laws of motion in which they construct practical situations from a chosen sport. Appropriate sports would include badminton, tennis, cricket, hockey, bowls and squash. Learners should present their demonstrations to the rest of the group. You can use these demonstrations to introduce the principles of reaction forces.
- In small groups, learners should complete research about reaction forces. Each group should then present visual representations (diagrams) of sports in which reaction forces are involved. These diagrams should be labelled with arrows to show the direction of the reaction forces.
- Introduce the concept of friction (static, dynamic and rolling) and the calculation of the coefficient of friction.
- Ask learners to research the role of friction in two different sports, and how friction can be minimised or maximised according to the demands of the sport.
- Involve learners in a practical activity that assesses the trajectories of a range of projectiles, e.g., a shuttlecock, a tennis ball, a football, a shot or a discus. Learners should then discuss the reasons for the trajectory of each projectile.
- Present footage of cyclists, swimmers and sprinters to show athletes who are affected by air resistance. Ask learners to discuss the following:
  - factors contributing to air resistance
  - sports equipment design to minimise effects of air resistance
  - suggestions about how air resistance could be minimised in other sports.
- Introduce the difference between air resistance and aerodynamics.
- Using textbooks and online sources of information, learners should research the implications of aerodynamics on sport and exercise activities, and answer the following questions:
  - Why do cricket balls swing in the air?
  - Why do golf balls have dimples?
  - How do F1 cars use aerodynamics?
  - How can footballs swerve in the air once kicked?
  - Why can tennis balls spin?
- Present footage of examples where lift is having an effect on equipment that is used for sports. Then ask learners to find still images of examples where forces are creating lift and to use arrows to show where the forces are impacting on equipment to create lift.

- Present practical examples of the Bernoulli effect in action. Ask learners to use examples to explain how the Bernoulli effect causes the paths of objects to deviate.

Learning aim C: Investigate angular motion in sport and exercise activities

- Introduce the topic and content of learning aim C by explaining what is meant by angular motion, and the aspects of angular motion that will be covered.
- Lead an individual practical activity that demonstrates the factors involved in identifying the centre of mass. Present five or six sporting objects of different shapes and sizes. Ask learners to identify the centre of mass of each object with a stick-on dot. Sporting objects could include a cricket bat, a baseball bat, a hockey stick, a golf club and a shuttlecock. Present images of athletes in different positions and ask learners to identify, with a stick-on dot, the location of the athlete's centre of mass. For example, a skier in a crouched position, a sprinter in the set position and a judoka in their starting position.
- Learners should discuss the locations of the centre of mass they chose and why they chose these places. If necessary, you can offer the correct location of the centres of mass.
- Involve learners in a practical activity to illustrate the relationship between centre of mass and stability. Learners should work in pairs in an environment with a soft floor or mats. The first learner should adopt different body positions (upright, crouched, leaning forward) and different stances (feet together, wide stance, split stance). The second learner will gently push the first learner at their shoulder to assess how easy it is to unbalance them in each position. Learners should feed back about which positions/stances are most stable/unstable.
- Working independently, learners should produce a booklet about stability in sport and the factors that affect stability.
- Introduce learners to the three types of levers (first class, second class and third class) and give examples of each type of lever.
- Using textbooks and online resources, and working independently, learners should research different types of levers, and how they impact on movement in sport. They should use this information to produce a document that visually represents the different types of levers, and gives sporting examples.
- Introduce the three axes of rotation (longitudinal, transverse and frontal) and ask learners to find examples of athletes moving in each of the axes of rotation.

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

This unit links to:

- Unit 1: Sport and Exercise Physiology
- Unit 2: Functional Anatomy
- Unit 5: Applied Research Methods in Sport and Exercise Science
- Unit 6: Coaching for Performance and Fitness
- Unit 9: Research Project in Sport and Exercise Science
- Unit 11: Sports Massage

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Sport and Exercise Science. Check the Pearson website (http://qualifications.pearson.com/en/support/published-resources.html) for more information as titles achieve endorsement.

Textbooks

Adams M et al, *BTEC Level 3 National Sport and Exercise Sciences – Student Book*, Pearson, 2016 ISBN 9781292133959

Burkett B, *Sport Mechanics for Coaches* (Third Edition), Human Kinetics, 2010 ISBN 9780736083591

Hall SJ, *Basic Biomechanics* (Fifth Edition), McGraw-Hill, 2007 ISBN 9780071106665

Rea S, *Sports Science: A Complete Introduction*, Teach Yourself, 2015 ISBN 9781473614895

Stafford-Brown J et al, *BTEC Level 3 National Sport and Exercise Sciences*(Fourth Edition), Hodder Education, 2016 ISBN 9781471878633

Journals

The following journals give the latest research in sport and exercise biomechanics, dealing with content areas that are covered in the unit specification:

Journal of Applied Biomechanics

Journal of Biomechanics

Journal of Sports Sciences

Sports Biomechanics

Websites

http://www.ausport.gov.au – The Australian Institute of Sport (AIS) website gives articles about biomechanics and links to other resources.

www.bases.org.uk/Biomechanics – The British Association of Sport and Exercise Sciences (BASES) website gives resources about biomechanics and the work of biomechanists.

http://www.gcmas.org/about – The website of the Gait and Clinical Movement Analysis Society (GCMAS) gives information and resources on gait analysis, one of the research areas in which biomechanists become involved.

http://isbweb.org/ – The website of the International Society of Biomechanists (ISB) gives links to information about biomechanics and biomechanics research.

http://www.quintic.com/ – Quintic Consultancy Ltd. gives software packages to capture footage of sports performance and packages to analyse it.

Unit 8: Specialised Fitness Training

Delivery guidance

Approaching the unit

This unit gives the learner 'hands-on' practical experience of planning fitness training sessions and programmes that are specific to the needs of performers from different sports. Therefore, access to fitness training equipment and facilities to accommodate fitness training is 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 fitness training equipment in use.

Learners will study the theory behind each fitness training method; they will then experience the process of going through each method and of supporting participants completing the method. The fitness training methods and programmes can be applied using learners within the class, learners from outside of the class such as school/college sports teams or people external to the centre/environment, providing appropriate safeguarding measures and ensuring that health and safety are in place.

Delivering the learning aims

Learning aim A

Learning aim A focuses on the theoretical principles of the demands of different types of sports, so that learners can understand the requirements of each sport.

You can deliver this learning aim through guest speakers, such as a strength and conditioning coach whose role is to design training programmes for specific teams or sports performers. Learners can also carry out independent research and group work to cover the variety of topics in this learning aim.

Initially, learners will need to explore the fitness demands of each sport, including the components of physical and skill-related fitness. This can then be taken to a higher level so that they are tailored to individual sports participation, to determine which components of fitness are required and to what degree they are required. The demands of each sport are explored even further, in relation to how the component body parts function, including the upper and lower body and the core along with the movement patterns that are incorporated into different sports. The unit also briefly covers the two main types of energy system, in terms of aerobic or anaerobic energy production and the energy expended for different sports.

Lastly, training programme design is explored in relation to improving fitness as well as considering other factors, such as the competing period, ways to prevent injury and involving other people in programme design, including the sports performers' manager. Where possible, learners could talk with the manager of a sports team to see how they influence the training programme design. Athletes and sports performers could also discuss their training programmes and the various factors that influence this design.

Learning aim B

For this learning aim, learners should be engaged in practical activities combined with theoretical delivery, where possible, so that they can experience the various forms of fitness training and have a better understanding of the physical requirements of each. You should discuss each of the listed components of fitness with learners, together with the importance of each component for a sports performer. For each listed component of fitness, you should discuss the theory behind the training method. This should be done either before or after practical participation, so that learners are clear about each method, and how and why it should be used. Where possible, fitness-training specialists could be invited to help support the delivery of each method. Where appropriate, they could bring specialised equipment, ensuring the health and safety of the participants when it is used.

Learning aim C

For learning aim C, learners will need to explore a fitness programme for different individuals; you could use a learner-centred research approach for this. You could give learners case studies of sports performers or they could carry out an analysis of each other's fitness requirements, in order to start the process of fitness programme design.

You will need to cover the principles of fitness training linked to specific sports and sports performers, while ensuring that the principles are suitably contextualised and that all the principles of training are met appropriately. Group and individual tasks could be set and information pooled within the group, to encourage peer learning and consolidate learner understanding. Learners can then present the fitness training programme they have designed for the individual they were working with, to the rest of the class. They should explain the requirements of the individual's sport, relating them to the fitness programme design.

Guest speakers, either those who have taken part in fitness training programmes or professional fitness training programme designers, could provide further information and real-life case studies. This will help learners to understand fully the benefits of this process and the links to professional careers with fitness programming as part of the job role.

Learning aim	Key content areas	Recommended assessment approach
A Examine the fitness requirements, physical characteristics and demands of sport that contribute to effective training and performance	**A1** Characteristics of sport **A2** Fitness demands of sports **A3** Movement patterns **A4** Energy systems and expenditure **A5** Importance and influence on training programme design	A report that evaluates how the planning of an athlete's training is influenced by the fitness demands, characteristics and movement patterns of the sport they perform
B Investigate methods of training for physical and skill-related fitness	**B1** Training for physical fitness **B2** Training for skill-related fitness **B3** Effectiveness and suitability of training	A report that evaluates the effectiveness of methods of training used to improve physical and skill-related fitness, justifying their contribution to improving performance in a chosen

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	methods to athletes' goals	sport
C Explore the planning of fitness programming	**C1** Collecting personal information to aid programme design **C2** Principles of training and their application to training programming **C3** Designing periodised training programmes **C4** Planning training sessions **C5** Evaluating the effectiveness of programming and training plan design	A report that evaluates the effectiveness of a training programme and associated training plan, supported by the production of a periodised training programme and a training plan for a selected aspect of the periodised training programme

Assessment guidance

It is suggested that learning aim A is assessed by a written report. Within the report, learners must address the planning of a fitness programme that takes into account the fitness demands, characteristics and movement patterns of the sport in which they are performing.

Learning aim B will contain a discussion of the different methods of fitness training for physical and skill-related fitness for a specific sport. This can be assessed either by written documentation or by verbal discussion.

Learning aim C requires the production of a written fitness programme, incorporating the principles of training, periodisation and a training session plan. The programme should be written taking into account the needs and requirements for an athlete taking part in specific sports and, where appropriate, specific positions in that sport, such as a goalkeeper in football.

You should refer to the assessment guidance in the unit specification for specific detail for each learning aim.

Getting started

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

Unit 8: Specialised Fitness Training

Introduction

Introduce the unit to your learners by designing a video-based quiz on the components of fitness required for different sports. The video clips should show a sportsperson performing techniques and skills specific to their position or their sport, such as a basketball player jumping up high to perform a layup. This will enable you to assess previous learning and is a fun way to engage learners. Outline that the unit explores fitness training methods and programming through practical experience and how to ensure that appropriate fitness training programmes are used for a specific individual in relation to their sport, ability and fitness levels.

Explain that learners will be equipped with both the practical and the knowledge-based skills to set up and run sport-specific training sessions, as well as to design training programmes for both physical and skill-related components of fitness.

Differentiation is essential during the delivery process; understanding and knowing your learners will enable you to do this effectively. Ensure that groups are of mixed abilities to provide peer support as well as stretching more able learners. Learners need to have a full understanding of the assessment criteria command verbs, which could be developed through questioning learners appropriately and through independent research.

Learning aim A – Examine the fitness requirements, physical characteristics and demands of sport that contribute to effective training and performance

- Introduce the topic and content.
- Learner-led research could be done in small groups, using the internet and textbooks, to research one sport and explore its characteristics, types of activity and characteristics of athlete's performance cycle for that sport. Each group should present their findings to the rest, gaining feedback about its strengths and areas for improvement.
- Use video footage of different sports with each footage showing one or more of the fitness demands of the sport, as listed in the unit content. Ask learners to determine the components of fitness required for each sport and order them in priority. At the end of each piece of footage, the whole group should hold a discussion to agree upon the fitness demands of each sport.
- Deliver movement patterns and follow up with paired work, using a worksheet on different sports and the interaction of each of the body parts along with the movement pattern for each. Each pair should feed back their findings for each sport.
- Deliver the energy systems and expenditure, with a list of sports where learners need to identify the main energy system used at different points in the sport and the approximate energy expenditure of each sport.
- Invite a guest speaker working in fitness programme design or one who has had a fitness programme designed for them, to discuss the different factors involved in fitness programme design and how the programmes can be individualised for the

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needs of different sportspersons.

Learning aim B – Investigate methods of training for physical and skill-related fitness

Where possible, this section should primarily involve practical delivery, as learners should experience each of the fitness training methods. Practical application may not be possible due to the equipment required for some fitness training methods. In this case, you could use video footage or a visit to a sport science training institute laboratory that has this equipment, so that learners are aware of what these fitness training methods are and how they are carried out.

For each fitness training method, you should cover:

- a definition of the component of fitness
- function of the component of fitness
- method of training used
- equipment required for each test
- the effectiveness of the fitness training method.

After each practical lesson, you should cover some theory where appropriate, so that learners can fully appreciate the science behind the fitness training method. The discussion should also include how suitable each method would be for a sports performer, depending on their needs in relation to their sport.

- For some fitness training methods, such as flexibility, you could provide a circuit of each flexibility training method. Small groups should go round the circuit to each station and carry out the flexibility training method.
- For other fitness training methods, such as Fartlek running, you could use whole group participation.
- Case studies can be used once learners have experienced each fitness training method. You should provide case studies of sports performers with their sport and, where appropriate, the position they play in, their physical activity level and areas that need to be improved. Learners then need to select appropriate fitness training methods/tests, based on the sport and the sportsperson's requirements.

Learning aim C – Explore the planning of fitness programming

- Working in pairs, learners could collect information from each other. This should include lifestyle and physical activity history, personal goals, aims and objectives to be achieved through training and attitude to training. Each person should interpret the information given by their partner and provide a summary, either verbally or as a written report.
- Introduce the principles of training.
- Group discussion can be held on 'What are the principles of training and how they relate to fitness programming?'
- Working individually, learners should consider these additional principles of training and if they are currently following a training programme, consider whether the programme is meeting these principles and how. For learners who are not in training, case studies of training programmes can be used and learners should assess whether the training programme is meeting the principles of training for the identified individual.
- Lead a practical delivery on warm-up and cool-down activities. Learners should then work in small groups to design their own warm-up and cool-down activities, specific to a sport of their choice.

- Present ways to measure training intensity for participants.
- Invite a guest speaker to discuss periodised training programmes and how they are designed to fit in with competition periods and lifestyle.
- Learners should work in small groups to start planning a training programme for a sportsperson of their choice. They should present their work to the rest of the group to get feedback about its strengths and areas for improvement.

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

This unit links to:

- Unit 1: Sport and Exercise Physiology
- Unit 2: Functional Anatomy
- Unit 3: Applied Sport and Exercise Psychology
- Unit 4: Field- and Laboratory-based Fitness Testing
- Unit 5: Applied Research Methods in Sport and Exercise Science
- Unit 6: Coaching for Performance and Fitness
- Unit 9: Research Project in Sport and Exercise Science
- Unit 10: Physical Activity for Individual and Group-based Exercise
- Unit 11: Sports Massage
- Unit 13: Nutrition for Sport and Exercise Performance
- Unit 14: Technology in Sport and Exercise Science
- Unit 15: Sports Injury and Assessment

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Sport and Exercise Sciences. Check the Pearson website (http://qualifications.pearson.com/en/support/published-resources.html) for more information as titles achieve endorsement.

Textbooks

Some of the textbooks below are set texts for the course and so cover information for each unit. Other textbooks are subject specific and contain information related to fitness testing and with detail for each fitness testing method, which higher level learners may find useful for independent research.

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 and Exercise Sciences – Student Book*, Pearson, 2016 ISBN 9781292133959

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

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

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

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

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

Stafford-Brown J et al, *BTEC Level 3 National Sport and Exercise Sciences*(Fourth Edition), Hodder Education, 2016 ISBN 9781471878633

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

Journals

The following journals provide peer-reviewed, reliable and valid research on a range of areas related to this unit. The audience for each journal ranges from level 3 to level 6 or higher, so some of the content may be too advanced for learners on this course.

American College of Sport Medicine's Exercise and Sport Science Reviews (Wolters Kluwer)

American College of Sport Medicine's Health and Fitness Journal (Wolters Kluwer)

British Journal of Sports Medicine (BMJ Publishing Group Ltd)

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

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

Research Quarterly for Exercise and Sport (Taylor & Francis)

Websites

The following websites contain up-to-date information on fitness testing. The audience for each website ranges from level 2 to level 6 or higher, so some of the content may be too advanced for learners on this course.

www.bases.org.uk – The British Association of Sport and Exercise Sciences website produces a range of research-based and up-to-date information on all aspects of sport and exercise science.

www.coachwise.ltd.uk – Coachwise is an agency for organisations that develop sports participation, coaching and talent programmes.

www.humankinetics.com – Human Kinetics provides educational resources and journals related to all aspects of sport.

www.sportsci.org – Sport Science is a journal and website for sports research.

www.sportscoachuk.org – Sports Coach UK is a technical agency for the education of sports coaches and other people engaged in teaching and encouraging sporting skills.

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

Unit 9: Research Project in Sport and Exercise Science

Delivery guidance

Approaching the unit

This unit aims to help learners apply a range of skills to 'plan, do and review' a research project in sport. You should allow learners to explore a topic of their interest as opposed to predetermining the project for learners, however, there must be appropriate appreciation of limitations of practice within the scope of the qualification. You will need to ensure that learners have appropriate access to different equipment and facilities, and that they have received sufficient training as part of their course to complete their project safely.

Delivering the learning aims

Learning aim A

Learners must first select a research topic. They would benefit from working in groups to create mind maps for their selected areas of interest. They could then develop their mind maps to work out what area within the topic they would like to expand on. It will be important for you to ensure that the topic ideas remain realistic for the level of the learner and that the resources required can be appropriately accessed. As such, planning projects using class members would aid the feasibility of planning.

One of the more challenging aspects of producing research proposals is learners being able to create a clear rationale. Learners should work towards a rationale and proposal that is within their scope of practice and the level of qualification. This rationale would usually be based on a contemporary issue within sport (e.g. factors affecting sports performance in extreme environments), a lack of research within a given topic area (e.g. perceptions of coach behaviours within a given sport) or an applied reason (e.g. trying to find out the effectiveness of a training method within a specific sport).

During this learning aim, learners should be taught about the structure of a research proposal. This could be done at the beginning of the learning aim, so that learners have had all of the information they need from the start, could be delivered continuously throughout the learning aim, or a combination of both, commensurate with the needs of learners. Within this process, learners should be taught about the purpose of research proposals and, ideally, the purpose of each section of the research proposal. This learning aim gives learners an opportunity to develop their problem solving and critical thinking skills, as they will need to decide on appropriate research methodology for their project ideas. Learners will also develop their collaborative and communication skills through exploring their ideas with their peers. This learning aim lends itself to group-based discussion work. There is much opportunity for peer feedback as learners discuss their research ideas, as well as the rationale and the evidence base behind their rationale, with each other.

Learning aim B

This learning aim centres on data collection and analysis. You should allow learners the opportunity to develop their skills in self-management, encouraging them to be proactive in organising the resources required to collect and analyse data. Learners should also be encouraged to develop their ICT skills through data analysis, using programmes such as Microsoft Word or Excel to analyse and display their qualitative or quantitative data. This learning aim requires learners to work independently on many aspects of their data collection and analysis.

Learning aim C

This learning aim centres on writing up the research project. You should introduce learners to the different writing styles that can be used to write up projects, as well as the standard structure for a research project. Providing opportunities for peer review of their written projects will engage learners in collaborative working and help them develop their critical thinking and communication skills by providing feedback to their peers.

Assessment model (in internally assessed units)

Learning aim	Key content areas	Recommended assessment approach
A Plan a sport or exercise science-based research project	**A1** Selecting a research topic and creating a rationale **A2** Deciding on aims and research questions **A3** Deciding on an appropriate research methodology **A4** Structure of the research proposal	A presentation that demonstrates a planned sport and exercise science-based research project.
B Carry out a sport or exercise science-based research project	**B1** Data collection **B2** Data analysis	A written sport or exercise science-based research report that follows a standard structure. Evidence of collected data. Evidence of analysed data. Witness testimony or observation record as appropriate.
C Produce a sport or exercise science-based research report	**C1** Writing styles appropriate for research projects **C2** Structure of the research report	

Assessment guidance

The first assessment for this unit is the presentation of a research proposal. Learners should present the plan for their research project, the rationale, aims, methodology and research questions in a structured fashion. There should be live evidence of the presentation (e.g. audio or video recording). It may be necessary to develop presentation skills with learners. They should understand how to combine text, images and tables in presentations, how to avoid reading from slides and how to avoid lengthy sections of text. They should develop the skills necessary to present in a clear, concise and coherent way. The second assessment should give a written account of the research project. It should follow the standard structure as laid out in the unit specification. This assessment should also include appropriate evidence of data collection and analysis (e.g. annotated photographs, interview transcripts).

Getting started

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

Unit 9: Research Project in Sport and Exercise Science

Introduction

The introduction to this unit could build on that provided in *Unit 5: Applied Research Methods in Sport and Exercise Science.* This could include discussing the benefits of being able to conduct primary research in a way that is meaningful for a level 3 learner (e.g. becoming a more informed practitioner by gaining a more in-depth understanding of a topic, career opportunities and progression). You may also help learners to reflect on some of the lessons learned through the successful completion of Unit 5. This would help to give more of a connected learning experience for learners.

Learning aim A: Plan a sport or exercise science-based research project

- Using discussion activities and mind maps, ask learners to think about which topic areas on the course they have been most interested in and why. After this, they can consider all of the topics they would like to know more about.
- Learners can search and read relevant literature to help them form the rationale for their project as well as developing their research aims and questions.
- Learners could engage in peer debate to refine their ideas, rationale and research aims/questions further.
- Once this is complete, learners should explore different research methods and decide on the most appropriate way of completing their desired project.
- Finally, after being taught about the standard structure of a research proposal, learners should produce a presentation for their research proposal.

Learning aim B: Carry out a sport or exercise science-based research project

- Learners should be taught how to effectively manage the data collection and analysis process. This includes key elements of organising and using resources, effectively recording data and the use of a research diary to document and reflect on the data collection and analysis process.
- Learners may benefit from an active researcher from the sector coming to deliver some lessons learned from real-life research. It would be useful for the guest speaker to focus on the demands of managing data collection and analysis.
- Learners should also be taught about reflective practice, and how this can be used to enhance their learning and develop their project data collection and analysis. Asking learners to reflect on any key aspect of their life, such as their performance in a game or event, can be a useful way of helping learners to develop reflective skills in a learner-friendly context. They can then apply this skill as they consider how best to collect and analyse their data.

Learning aim C: Produce a sport or exercise science-based research report

- In learning aim C, learners should be taught about the different writing styles that can be used for writing projects. These are detailed in the unit specification. Learners should have the opportunity of using these styles before writing their report. Learners could engage in peer feedback by critiquing their peers' work and providing constructive comments.

- Learners should be taught about the standard structure of a project write-up so that they are empowered to produce their report independently. A useful model for teaching the different sections is to discuss the overall structure of the report, followed by the purpose and structure of each aspect of the project.
- A significant amount of time in this learning aim will involve learners working on their research report independently.

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

This unit links to:

- Unit 3: Applied Sport and Exercise Psychology
- Unit 4: Field and Laboratory-based Fitness Testing
- Unit 5: Applied Research Methods in Sport and Exercise Science
- Unit 7: Biomechanics in Sport and Exercise Science
- Unit 8: Specialised Fitness Training
- Unit 11: Sports Massage
- Unit 12: Sociocultural Issues in Sport and Exercise
- Unit 14: Technology in Sport and Exercise Science.

Resources

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

Textbooks

Adams M et al, *BTEC Level 3 National Sport and Exercise Sciences – Student Book*, Pearson, 2016 ISBN 9781292133959

Gratton C and Jones I, *Research Methods for Sports Studies*, Second Edition (Routledge, 2010) ISBN 9780415493932 – useful textbook on research methods that will provide a helpful overview of many of the topics included in this unit.

Pitney WA and Parker J, *Qualitative Research in Physical Activity and the Health Professions* (Human Kinetics, 2009) ISBN 9780736072137 – useful textbook on qualitative research.

Stafford-Brown J et al, *BTEC Level 3 National Sport and Exercise Sciences*(Fourth Edition), Hodder Education, 2016 ISBN 9781471878633

Journals

Qualitative Research in Sport, Exercise and Health (Taylor & Francis) – publishes different articles on qualitative research in sport, exercise and health.

Websites

http://www.bases.org.uk/write/Documents/BASES_Code_of_Conduct_(3).docx – The British Association of Sport and Exercise Science's Code of Conduct, which outlines different ethical considerations associated with research and professional practice.

http://www.bases.org.uk/Ethics-and-Participation-in-Research-of-Young-People – The British Association of Sport and Exercise Science's expert statement on ethics and participation in research of young people, which outlines ethical issues unique to research with children and young people.

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.

Unit 10: Physical Activity for Individual and Group-based Exercise

Delivery guidance

Approaching the unit

This unit gives learners a 'hands-on' practical experience of planning and delivering an individual and a group-based exercise session. Therefore, access to a gym that contains free weights, fixed resistance weights and cardiovascular equipment, as well as an area that can be used for circuits sessions is essential. Learners may benefit from a site visit to a health and fitness centre to experience a gym and circuits class and to see the types of equipment available in the health and fitness industry. From this, they will be able to see and experience the types of fixed resistance machines and cardiovascular equipment available, as well as the areas and weights available for free weight exercises and circuits sessions.

Learners will explore different ways that are used to screen clients before they take part in gym-based exercise sessions, which is an essential health and safety requirement for gym-based exercise instructors. They will also explore the different types of gym-based exercise equipment, stations that can be used in circuits and ways to perform exercises safely.

Learners will then plan and deliver an individual or a group-based exercise session, so having access to participants to run the session is a requirement for this unit.

Delivering the learning aims

Learning aim A

Learning aim A focuses on the theoretical and practical ways to screen clients before participation in a gym-based exercise session.

It is very likely that some learners may already have an experience of taking part in screening themselves, if they are members of a gym. However, some may not have any experience of going through a screening process and you will have to provide guidance and support to these learners to help to develop their knowledge and skills in this area. You may wish to invite fitness instructors from the range of local sports-related organisations around your centre to talk about why it is important to screen clients. They may also provide examples of screening questionnaires, maintaining client confidentiality and informed consent, and carry out simulated interviews with members of the class, so that all the class can see what the process involves.

Factors affecting the safe participation in exercise of specific clients may be challenging for some learners, if they have no experience of knowing what the requirements are, for example, for antenatal/postnatal women or older people (50+).

Visiting gyms and health and fitness centres that run sessions specifically for these clients may help to support learners in gaining a better understanding of

these clients' needs. Alternately, inviting exercise instructors to discuss these clients' requirements may help to support learners' understanding in this area.

Learning aim B

For this learning aim, learners should be engaged primarily in practical activities combined with some theoretical delivery.

Learners will need to be able to take part in and learn the key teaching techniques for the types of exercises listed in the unit content, including cardiovascular exercises, fixed resistance machines and free weights.

Learners who have practical experience of gym-based exercise sessions will have already gained some ideas on the correct techniques for each exercise. However, other learners who are not used to the gym should be taught these basics.

It is a good idea to have learners take part in a range of different circuit training sessions – from there, they can work in groups to devise their own circuit training session. Initially, the circuits can be designed to improve either aerobic endurance or muscular strength and endurance. This can then lead on to designing circuits that train both components of fitness.

Learning aim C

For this learning aim, learners should be engaged in practical activities combined with theoretical delivery. It is a good idea to have learners work in pairs to deliver training for cardiovascular, fixed resistance and free weight exercises in the gym. They can then start to plan a gym-based exercise session.

Learners can also work in groups to produce a full plan for a circuit session, including circuit cards. The group can discuss ways to adapt exercises to make them more or less intense and then apply them to the circuit training cards.

Learners will need to know how to correct people's technique. If learners can work with participants who are not peers and are not studying this unit, it will help them to spot incorrect techniques and learn appropriate methods of correcting the participant's technique. If only peers are available, it may mean that there are very few incorrect techniques demonstrated by the participants, as they should already know how to perform the exercises. Peer correction can also lead to a more relaxed approach, which is not appropriate for clients in industry environments.

Learners will need access to an appropriately equipped gym for the delivery and assessment of this unit, together with a willing participant, or a group of participants if delivering the group exercise session, to instruct in the summative assessment.

The formative instruction in gym practicals could be visually recorded so that learners can see how they performed in the delivery of the session and look to see if there are areas that they could improve on. Learners should also be encouraged to ask for feedback from the participant to find out if the gym-based exercise was appropriate in terms of selection of exercise, timing, motivation and teaching points. It would be beneficial if the feedback from participants also included strengths and areas for improvement in relation to the instructor's skills, such as communication and motivation.

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Learning aim	Key content areas	Recommended assessment approach
A Explore the processes of health screening prior to physical activity participation	**A1** Participant screening **A2** Factors affecting safe exercise participation	A written report focusing on screening activity results, factors affecting safe exercise participation and recommendations based on the results and factors, supported by evidence of completed lifestyle screening activities
B Examine different types of exercises for individual and group-based exercise sessions	**B1** Performing exercises safely **B2** Types of cardiovascular exercises **B3** Types of resistance-based exercises **B4** Activities for an individual exercise session **B5** Activities for a group-based exercise session	An evaluative report into the planning and delivery of the gym-based session, supported by an individual exercise session plan, a group exercise session plan and observation records/video evidence of gym-based exercise session delivery
C Undertake planning and instructing of individual and group-based exercise sessions	**C1** Aims and objectives of the exercise sessions **C2** Individual exercise session planning **C3** Group exercise session planning **C4** Pre-exercise preparation **C5** Instructing individual exercise session **C6** Instructing group-based exercise session **C7** Reviewing own performance in providing gym-based exercise	

Assessment guidance

It is recommended that you follow the suggested assignment format as detailed in the Authorised Assignment Briefs.

Learning aim A is suggested to be assessed via completing screening documentation on factors affecting safe exercise participation.

For learning aims B and C, learners need to produce a written report on the planning and delivery of the gym-based session, supported by an individual

exercise session plan or alternatively a group exercise session plan, plus observation records and video evidence of the exercise session delivery.

They also need to write an evaluation report on their planning and delivery of the exercise session.

You should refer to the assessment guidance in the unit specification for specific detail.

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Getting started

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

Unit 10: Physical Activity for Individual and Group-based Exercise

Introduction

You will find it particularly useful to introduce this unit by arranging guest speakers from the health and fitness and sports industry who work in gyms.

These speakers will be able to give learners an insight into the health and safety aspects of instructing individual and group-based exercise sessions and the types of participants they work with.

You may wish to undertake some preparation before these talks/visits by tasking learners to think about what sort of information would be most useful to them; for example, the screening process, types of exercises, types of gym and circuits exercise equipment. Learners could then devise brief questionnaires to ensure that appropriate information is collected. Alternatively, you could prepare a brief for the visitors so that the information given focuses on the learners' requirements.

Differentiation is essential during the delivery process; understanding and knowing your learners will enable you to do this effectively. Some learners may already have an experience of participating in gym-based exercise sessions and so have a very good idea as to what the sessions entail. It is, therefore, very important that when the learners are carrying out group work, they are of mixed abilities to provide peer support as well as stretching more able learners. Learners will need to understand the assessment criteria command verbs fully, which can be developed through questioning learners appropriately, placing posters around the learning environment with definitions of command verbs as well as by independent research.

Learning aim A – Explore the processes of health screening prior to physical activity participation

- Introduce the topic and content.
- Learners should work in pairs to consider what personal information is required from participants when they are about to start a physical activity programme.
- Invite exercise instructors to talk to the learners about working in the industry and the importance of screening clients before their participation.
- Arrange a class discussion about what sort of information should be included in screening a new client and in determining a participant's needs for a physical activity programme.
- Organise visits to health and fitness clubs for learners to see and experience a health screening process carried out in an industry environment as well as to see the types of questionnaires used in screening.
- Learners independently research questionnaires and the types of questions used in them to provide a full and meaningful screening of clients before exercise participation.
- Arrange a class discussion about the importance of temporary deferral of exercise for specific clients and the reasons behind why this is in place.
- Invite exercise instructors who work with different participants, including 14–16-year-olds, mature people (50+) and antenatal/postnatal women to speak to the learners about each of these groups' requirements and the key considerations for

their safe participation in exercise.

Learning aim B – Examine different types of exercise for individual and group-based exercise sessions

- Introduce the learning aim.
- Learners can visit a gym or use the centre-based gym. In the gym, they can take part in exercises using the following equipment:
  - cardiovascular
  - free weights
  - resistance machines.
- Learner should have access to the full range of types of cardiovascular exercise equipment covered in the unit content and be shown how to use it safely. They should then perform the specified exercise for a set time to gain experience of how the exercise feels and how to increase and decrease the intensity.
- Learners can then instruct a peer about how to use the equipment, taking into account the correct positioning and intensity for that person.
- Learners should have access to the full range of types of fixed resistance exercise equipment covered in the unit content and be shown how to use it. They should then perform sets and repetitions of that exercise to gain experience of how the exercise feels and how to change the weights, repetitions and sets to increase muscular strength and endurance.
- Learners can then instruct a peer about how to use the equipment, taking into account the correct positioning and weights for that person.
- Learners can take part in a full class session in which each body weight exercise is demonstrated and key teaching points are provided. Learners then need to teach a small group about one of the body weight exercises, providing accurate demonstrations and appropriate teaching points.
- Learners can take part in a full class session in which each free weight exercise is demonstrated and key teaching points are provided. Learners then need to teach each other, in a one-to-one situation, about each of the free weight exercises, providing accurate demonstrations and appropriate teaching points.
- Use a combination of a theory and a practical session to discuss alternative and adapted exercises for each type of exercise so that learners can experience the adapted exercise and know how to demonstrate it accurately.
- Lead a discussion on the benefits of circuits-based training.
- You, or a guest fitness instructor, should lead a circuits-based practical participation session. This should cover all the required elements of good practice – including a combination of cardiovascular and resistance training, alternating muscle groups at each station and a suitable rest period for recovery.
- Learners should then take part in exercises for the different stations in a circuit. Each lesson will concentrate on a specific component of fitness – aerobic endurance, muscular strength, muscular endurance, core strength and sport-specific stations. Technique for each station must be delivered, with teaching points and suitable circuit cards. Adaptations to make the exercise harder and easier must also be covered, as well as alternative exercises for different participants' needs.
- Learners should take part in circuit training classes with different layouts to experience the strengths and weaknesses of each type.
- Learners can start to lead parts of the warm up and cool down of these sessions to

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help to develop their group communication skills.

- Learners then work in small groups to plan a circuit, including circuit cards and present this to the rest of the class. The class should provide feedback to the groups on the strengths and areas for improvement of their circuit design. Learners should adapt their circuit in line with this feedback.

Learning aim C – Undertake planning and instructing of individual and group-based exercise sessions

This part of the unit will primarily involve practical delivery, as learners should be able to have an experience of instructing an individual or a group-based exercise session.

- Learners can work in pairs to plan an individual or group-based practical session. The pairs can then feed back to the rest of the group and discuss strengths and areas for improvement.
- Learners can work in pairs to deliver parts of their plan to each other. At the end of each section, they can review the instruction in terms of demonstrations of the exercises, communication, observation, intensity of the exercise and whether appropriately adapted exercises were provided. The learners can then adapt their instructing style in line with this feedback.
- To help to improve confidence and instructing styles, it would be beneficial for learners to instruct different members of the group rather than just one person so that they have experience of instructing a range of different people.
- Video footage of each learner delivering part of an individual or group-based exercise session can be recorded to provide a feedback to the learner on their instructing style. This footage can be shown to the whole class for a discussion about the strengths and weaknesses of each instructor's methods and how they provided individual support to the participant.
- Invite a guest speaker from the health and fitness industry to discuss how they work with participants with different needs and adapt exercises to meet their needs. Methods of motivation and communication can also be discussed and demonstrated.
- Arrange a class discussion about methods of getting feedback from class participants. In pairs, learners should devise a questionnaire that could be given to participants at the end of the class. Learners should then share their questionnaires and ideas on how to gain feedback in a class discussion.
- Learners should lead research into continuing professional development available for people wanting to work as gym-based exercise instructors. A whole class discussion can follow on from this research.

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

This unit links to:

- Unit 1: Sport and Exercise Physiology
- Unit 2: Functional Anatomy
- Unit 3: Applied Sport and Exercise Psychology
- Unit 4: Field- and Laboratory-based Fitness Testing
- Unit 6: Coaching for Performance and Fitness
- Unit 8: Specialised Fitness Training
- Unit 11: Sports Massage
- Unit 13: Nutrition for Sport and Exercise Performance
- Unit 14: Technology in Sport and Exercise Science
- Unit 15: Sports Injury and Assessment

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Sport and Exercise Sciences. Check the Pearson website (http://qualifications.pearson.com/en/support/published-resources.html) for more information as titles achieve endorsement.

Textbooks

Adams M et al, *BTEC Level 3 National Sport and Exercise Sciences – Student Book*, Pearson, 2016 ISBN 9781292133959

American College of Sports Medicine, *ACSM Fitness Book* (Second Edition), Human Kinetics, 1997 ISBN 9780880117838 – Provides advice on the benefits of regular physical activity and information about specific exercises and activities.

Coulson M, *The Fitness Instructor's Handbook: A Complete Guide to Health and Fitness (Fitness Professionals)* (Second Revised Edition), A&C Black/Bloomsbury Publishing, 2013 ISBN 9781408178263 – A clear, concise guide for people working in the industry and for learners, covering all components of the industry standards for level 2 and 3 qualifications.

Griffin JC, *Client-centered Exercise Prescription* (Second Edition), Human Kinetics, 2006 ISBN 9780736054959 – An easy-to-use resource that focuses on the needs of individual clients, including case studies.

Harris J and Elbourn J, *Warming Up and Cooling Down: Practical Ideas for Ensuring a Fun and Beneficial Exercise Experience* (Second Edition), Human Kinetics, 2002 ISBN 9780736038782 – Provides information about warming up and cooling down along with practical examples.

Jackson AW et al, *Physical Activity for Health and Fitness*, Human Kinetics, 2004 ISBN 9780736052054 – Useful to help learners understand that physical activity should be a lifelong priority.

Olds T, *Pre-Exercise Health Screening Guide*, Human Kinetics, 1999 ISBN 9780736002103 – A useful resource to learn about the reasons for using pre-exercise screening and how to apply pre-exercise screening.

Stafford-Brown J et al, *BTEC Level 3 National Sport and Exercise Sciences*(Fourth Edition), Hodder Education, 2016 ISBN 9781471878633

Journals

The following journals will provide useful information about all aspects of physical activity and exercise.

ACSM Journal of Medicine & Science in Sports & Exercise

Journal of Human Sport and Exercise

Journal of Physical Activity and Health

Websites

www.bases.org.uk – The British Association of Sport and Exercise Sciences (BASES) is the professional body for sport and exercise sciences.

www.brianmac.co.uk – Brian Mac (Brian Mackenzie) is an experienced sports performance coach. This site contains resources and information on circuit training planning and delivery.

www.pponline.co.uk – The Peak Performance website contains articles and information about instructing exercise classes.

www.topendsports.com – Topend Sports provides articles and information on instructing and exercise classes.

Unit 11: Sports Massage

Delivery guidance

Approaching the unit

This unit gives learners the opportunity to understand the sports massage profession and industry standards, and the importance of sports massage to the sport and exercise performer. Learners must have access to appropriate facilities.

This unit is highly practical. It will develop learners' ability to undertake client consultation and assessment, and to use findings to formulate a safe and appropriate treatment plan. Learners will also develop the practical massage skills required to perform sports massage, enabling them to implement the treatment plan in a safe manner. Practical skill application allows integration of theoretical knowledge.

You will find that learners start this unit anticipating practical activity. This eagerness should be captured, as learners will benefit from early exposure to the equipment and environment in which they will be working. Initial introductions should engage learners right from the outset, maybe by using digital footage that emphasises the importance of sports massage and assessment to ensure optimum sports performance.

Delivering the learning aims

Learning aim A

Learning aim A introduces the industry standards of practice, professional associations and the role of a sports massage practitioner. Professional associations should be explored through a research-based learner-centred approach, using the internet.

Learners can explore the functions of professional associations, and the standards and requirements they set for compliance within the industry. Addressing industry standards can be a little dull for learners. It is, therefore, essential to engage learners fully by applying theory to practice, using real-life working environments. This could be achieved by visiting a range of environments in which sports massage therapists work. Learners can consider, compare and contrast standards such as health and safety, environment, equipment, protocols and therapist conduct. If visits are difficult, you could utilise resources such as digital footage, and technology such as Google Earth to capture environments. Guest speakers, such as sports massage therapists and sports therapists, could also be invited.

Learners should understand the role and responsibilities of the sports massage practitioner in working as part of a multi-disciplinary team to deliver safe and effective massage.

Learning aim B

Learning aim B focuses on the theoretical and practical skills needed for the learner to undertake client consultation and assessment. Learners should have ample time to show progression across the skills required in the consultation process. Demonstration of skills and techniques in undertaking the assessment of clients should be used, as well as video feedback and peer coaching. Initially learners should have the opportunity to participate with support, but as they gain confidence, they should be allowed to take responsibility for their own performance and the safety of their clients. Target setting between sessions will encourage improvements in performance.

Learners should review their own skills, techniques and performance, and consider strengths and required areas for improvement. Besides learners reviewing their own performance, you should give them regular feedback and action points, and encourage peer review.

Learners will need to understand the findings from the consultation and assessment, in order to develop a safe and appropriate treatment plan. Discussion should form the basis for exploring clinical reasoning and planning, using real-life examples and scenarios. Some tutor-led delivery will be required to set the parameters for proceeding with treatment, and the need for referral.

Learning aim C

Learning aim C focuses on the practical skills needed for learners to carry out sports massage. Learners should have ample time to show progression across all skills and techniques. Demonstration of skills and techniques should be used, as well as video feedback and peer coaching. Initially learners should have the opportunity to participate with support, but as they gain confidence, they should be allowed to take responsibility for their own performance and their client's safety. Target setting between sessions will encourage improvements in performance.

Learners should review their own skills, techniques and performance, and consider strengths and required areas for improvement. Besides learners reviewing their own performance, you should give them regular feedback and action points, and encourage peer review.

Some formal delivery will be required to inform learners of the factors they need to consider at all times during treatment, such as working with insurance, client-informed consent and appropriate and accurate record keeping. Learners should also be informed of the consequences of not identifying contraindications, not referring when needed and adverse reactions to treatment. Discussion should be used to develop and confirm learners' understanding and ability to justify treatments administered.

Learning aim D

Learning aim D addresses the physical, mechanical and psychological effects of sports massage techniques. Initially this could be a research-led learner activity. Small groups of learners could, as a team, research on agreed aspects. The teams could then amalgamate information (snowball effect), and present to other learners. There may be aspects of tutor-led delivery or discussion included, with a heavy emphasis on contrasting sporting examples to consolidate learning. Learners also need to understand which techniques elicit which physical, mechanical or psychological effects.

Integration with treatment planning knowledge is essential here. You should encourage learners to address questions such as the following:

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- What does the performer require to optimise their sporting performance?
- What is the learner going to do?
- How are they going to do it?
- Why are they doing this?
- What benefits should they achieve?

This will allow learners to justify the effectiveness of the treatment, and to discuss future recommendations and considerations about treatment.

This level of critical thinking should be encouraged in a logical and progressive thought pattern, using examples from a range of contrasting sports and performers.

Learning aim	Key content areas	Recommended assessment approach
A Understand the sports massage profession	**A1** Industry standards of practice **A2** Professional associations **A3** Sports massage practitioner role	An extended essay, focusing on discussing industry standard practices, professional associations and the role of the sports massage practitioner
B Undertake client consultation and assessment	**B1** Assessment **B2** Treatment plan	Learners will need to select two contrasting sports performers. For each performer, conduct a consultation and assessment, and formulate an appropriate treatment plan
C Carry out sports massage on a sports performer	**C1** Massage application **C2** Considerations for treatment	Conduct sports massage in accordance with the treatment plan. Written justification will address the treatments administered, discussing the physiological, mechanical and psychological responses to sports massage. The effectiveness, future recommendations and considerations will also be justified. A report evaluating the importance of sports massage and assessment in ensuring optimum performance of the sports performer
D Examine the importance of sports massage to the sport and exercise performer	**D1** Physical effects **D2** Mechanical effects **D3** Psychological effects	

Assessment guidance

It is recommended that you follow the suggested assignment format detailed in the unit specification.

For assignment 1, you should set a scenario that is vocationally relevant, and of an appropriate context for the learner to fulfil the required criteria and unit content. An extended essay will be produced demonstrating understanding of the sports massage profession, including industry standards of practice, professional associations and the role of the sports massage practitioner.

A vocationally relevant scenario for a sports massage practitioner may be used to set an appropriate context, and to allow full coverage of the unit content. As an alternative, learners can research relevant working environments independently, including clinical, non-clinical, events and sports clubs. Learners will produce an extended essay that demonstrates understanding of the sports massage profession, including industry standards of practice, professional associations and the role of the sports massage practitioner. Attention should be paid to verb usage at pass, merit and distinction levels. Specific examples are required for A.M1. For A.D1, coverage of all working environments is required, as well as addressing the benefits of working in a multi-disciplinary team.

Assignment 2 addresses the consultation and assessment procedure, and formulation of a safe and effective treatment plan. Assignment 3 combines and integrates learning aims C and D, and allows learners to carry out the treatment plan and perform sports massage. Both the assignments have a high practical content, and thus you must ensure you comply with any requirements for standards verification, such as digital recording or annotated photographs.

Learners will select two contrasting sports performers. This means each performer has contrasting requirements (i.e., the nature of the benefits required, such as physical, mechanical and psychological, are different for each performer). This will allow for the breadth of coverage of unit content through the assessment of all learning aims. It is essential that you monitor the selection of performers, so that learners are not disadvantaged, and to allow scope in the written requirements. Ideally, learners will conduct the consultation and assessment, and carry out the sports massage, on the same sports performer. However, so that learners are not disadvantaged, simulation may be used where required; for example, peers can be used.

For assignment 2, for each performer, learners will conduct a consultation and assessment. Consultation and assessment forms will need to be completed accurately and submitted with the treatment plan, which must be safe. To attain B.M2, the learner's manner must be confident and effective, and the plan must also be effective. Confident means that there should be no hesitation or uncertainty when conducting the consultation, assessment or sports massage treatment. Effective means that the procedure must be capable of producing the expected/intended results, were the consultation, assessment and sports massage to be applied in a real-life industry situation. In order to achieve B.D2, the learner must justify the consultation and assessment procedure adopted (what has the learner done and why), and how both treatment plans have been produced to meet the needs of the two contrasting sports performers (why have they produced that specific plan for each performer).

Assignment 3 gives learners the opportunity to perform the safe treatment plans formulated in assignment 2. On separate occasions the learner will apply and perform sports massage appropriately, upholding sports massage standards. To achieve D.P4, learners will produce a written explanation of the physiological and

mechanical responses; discussion will be specific to each performer, with examples for D.M4, and evaluation for CD.D3. There should be justification for the effectiveness of the sports massages, providing future recommendations and considerations.

When conducting practical aspects, professional standards (including appearance) must be upheld. Commercially acceptable times for consultation and assessment should also be adhered to. Although timings vary, the recommendation would be between 30 and 60 minutes for consultation and assessment, and 30 and 45 minutes for conducting a sports massage. Learners should be encouraged to seek feedback to support them when addressing any future recommendations or considerations.

Getting started

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

Unit 11: Sports Massage

Introduction

Introduce the unit through a class discussion, with the aim of getting learners excited about a highly practical unit, the prospect of working with clients and being equipped with sports massage skills. Discussion should include learners' own experiences of sports massage, sporting environments, use of sports massage by amateur and professional sports performers. It is also useful to include digital recordings, clips on video sharing websites and summary of the importance of sports massage and assessment in ensuring optimum sports performance.

Differentiation is essential during the delivery process, and understanding and knowing your learners will enable you to do this effectively. For example, you should ensure that groups are of mixed abilities, and reflective of mastery and developmental tasks. This allows achievement by all, and stretching of the more able learners. You should attend to the Bloom's taxonomy verb usage, such as describe, explain, assess, analyse, and develop your level of questioning appropriately with each learner. During peer review, problem solving should be encouraged, in addition to the evaluation and review process. During the application of practical techniques, differentiate your questions according to the learner.

Learning aim A – Understand the sports massage profession

- Introduce the topic and content about industry standards of practice, professional associations and the role of a sports massage practitioner to your learners. Devise and use a quiz to assess learner's knowledge.
- Divide class into small groups, with each group assigned a professional association. Using the internet, learners should research the role, function, benefits, continuing professional development (CPD) requirements and professional standards expected of the association. Each group gives a mini presentation to their peers, encouraging questions and providing answers.
- Invite a guest speaker, e.g., a sports massage therapist or a healthcare practitioner, such as a sports therapist who is also qualified in sports massage. Other speakers may include sports managers and health and safety officers. Guest speakers should discuss aspects relevant to their job role, e.g., career pathway/opportunities, environments worked in, their role as part of a multi-disciplinary team, standards of practice, legal aspects, such as child protection and working with vulnerable adults, health and safety, emergency protocols and professional conduct. Learners should prepare interview-type questions to prompt the speaker, if necessary.
- Take learners to different sports massage working environments or, if not possible, use digital recordings or Google Earth to gain an appreciation of different working environments. Learners should be encouraged to reflect, compare and contrast standards of practice, requirements, and practitioner roles within different working environments.
- Use formal delivery to give an overview of the learning aim. Use questions and answers to determine learners' understanding, and the ability to give specific examples. Differentiate questioning according to the learners' abilities.

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Learning aim B – Undertake client consultation and assessment

- Introduce the topic and content of learning aim B to your learners. Clear class boundaries and parameters should be set, and agreed upon, in order to uphold professional standards during all practical lessons.
- Give formal delivery of subjective assessment, and justification of why each piece of information is required. In a tutor-led demonstration of subjective assessment, learners to feed back on professional standards, and subjective assessment content. Oral questioning to confirm learner understanding of the requirements for each component should be performed.
- Give formal delivery of objective assessment, and justification of why each piece of information is required. In a tutor-led demonstration of objective assessment skills and techniques, learners practise extensively on a range of clients. The clients should ideally be active people and external to the class.
- Learners demonstrate subjective and objective assessment of peers, encouraging peer review.
- Learners conduct a subjective and objective assessment on a client on several occasions. Ideally, the client should not be a peer, although it may be necessary to use peers if multiple clients are not available. Video feedback and peer coaching should be used to aid learner reflection, and to identify strengths and areas for improvement.
- Learners select a client they have assessed and discuss, using pertinent questioning by you and peers, their clinical reasoning and planning (what are you going to do? how? and why?). Learners should be questioned about the parameters for proceeding with treatment, and when referral is required.

Learning aim C – Carry out sports massage on a sports performer

Learning aim D – Examine the importance of sports massage to the sport and exercise performer

- Introduce the topic and content of learning aim D to your learners. It is suggested that you deliver learning aim D content before delivering learning aim C; this is to allow full integration and application of theory to practical skills.
- In small groups, learners allocate between themselves groups to research physical, mechanical and psychological effects of sports massage. Groups who have researched the same topic snowball learning to share and consolidate their research findings. Learners prepare and give mini presentations to peers. Group discussion, following each presentation, with questions and answers, will consolidate learners' understanding.
- Introduce the topic and content of learning aim C. Formal delivery should be used to introduce learners to the types of massage and massage techniques, including the use of digital clips and/or video sharing websites. You should also introduce and discuss adverse reactions, aftercare and contra-indications.
- Give practical demonstration of skills and techniques, highlighting considerations for treatments. Initially, all techniques should be learned using the posterior aspect of the legs. Once techniques and confidence have developed, demonstration and practice on anterior aspect of legs, torso and arms should be taught and learned. Feedback should be encouraged in the form of digital recording, from you and from class peers. You should encourage learners to reflect on strengths and areas for improvements, as well as setting targets for development. Oral questioning should be used frequently to ascertain learners' understanding of what they are doing and why.

- It is essential when delivering learning of practical sports massage skills that you make continual reference to learning aim D content, to allow learners to synthesise information.
- Conduct a consultation and assessment role play. Learners should formulate a safe and effective treatment plan. You should question learners during the assessment process, to justify what they have done and why.
- Learners should conduct sports massage treatment, ensuring all professional standards are upheld. You should question learners during the treatment plan to justify what they have done and why.
- Before assessment, learners should reflect on the treatment they delivered, justifying its effectiveness, identifying future recommendations and considerations, strengths and further areas for improvement.
- Ask learners to write a newspaper article evaluating the physical, mechanical and psychological effects of sports massage, and its effect on sport performance. Peer review to critique a selection of anonymous articles.

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

This unit links to:

- Unit 1: Sport and Exercise Physiology
- Unit 2: Functional Anatomy
- Unit 3: Applied Sport and Exercise Psychology
- Unit 5: Applied Research Methods in Sport and Exercise Science
- Unit 6: Coaching for Performance and Fitness
- Unit 7: Biomechanics in Sport and Exercise Science
- Unit 8: Specialised Fitness Training
- Unit 9: Research Project in Sport and Exercise Science
- Unit 10: Physical Activity for Individual and Group-based Exercise
- Unit 13: Nutrition for Sport and Exercise Performance
- Unit 15: Sports Injury and Assessment

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Sport and Exercise Science. Check the Pearson website (http://qualifications.pearson.com/en/support/published-resources.html) for more information as titles achieve endorsement.

Textbooks

The following textbooks contain information about all aspects of sports massage and professional practice. They also give wider reading opportunities to stretch learners.

Adams M et al, *BTEC Level 3 National Sport and Exercise Sciences – Student Book*, Pearson, 2016 ISBN 9781292133959

Benjamin PJ and Lamp SP, *Understanding Sports Massage* (Second Edition), Human Kinetics, 2004 ISBN 9780736054577

Cash M, *Sport & Remedial Massage Therapy*, Ebury Press, 1996 ISBN 9780091809560

Findlay S, *Sports Massage (Hands-on Guides for Therapists)*, Human Kinetics, 2010 ISBN 9780736082600

Fritz S, *Sports & Exercise Massage* (Second Edition), Mosby, 2013 ISBN 9780323083829

Gledhill A, Mackay N, Forsdyke D and Randerson K, *Foundations in Sports Therapy*, Heinemann, 2011 ISBN 9780435046859

Johnson J, *Postural Assessment (Hands-on Guides for Therapists)*, Human Kinetics, 2012 ISBN 9781450400961 – This book contains information that relates directly to objective assessment.

McGillicuddy M, *Massage for Sport Performance*, Human Kinetics, 2010 ISBN 9780736083010

Stafford-Brown J et al, *BTEC Level 3 National Sport and Exercise Sciences*(Fourth Edition), Hodder Education, 2016 ISBN 9781471878633

Mills R and Parker-Bennett S, *Sports Massage: Candidate Handbook*, Heinemann, 2004 ISBN 9780435456528

Paine T, *The Complete Guide to Sports Massage* (Second Edition), A&C Black Publishers Ltd., 2007 ISBN 9780713685794

Ward K, *Hands on Sports Therapy*, Cengage Learning Vocational, 2004 ISBN 9781861529206

Journals

The following journals provide articles relating to varied aspects of sports massage:

British Journal of Occupational Therapy

Clinical Journal of Sport Medicine

International Journal of Sports Medicine

International Journal of Therapeutic Massage & Bodywork

Journal of Alternative and Complementary Medicine

Journal of Bodywork and Movement Therapies

Journal of Physiotherapy & Sports Medicine

Physical Therapy in Sport

The Journal of Sports Medicine and Physical Fitness

Websites

www.basrat.org – BASRaT (the British Association of Sport Rehabilitators and Trainers) is the UK regulator for Sport Rehabilitation graduates who are trained in sports and exercise medicine.

www.cnhc.org.uk – The CNHC (Complementary and Natural Healthcare Council) gives a UK voluntary register of complementary therapists such as for Alexander technique teaching, aromatherapy, hypnotherapy, massage therapy, reflexology and sports therapy. Its website contains information about how to choose a complementary therapist.

www.fht.org.uk – The Federation of Holistic Therapists is the largest leading professional association for therapists in the UK and Ireland. Content includes specialist therapy articles and the latest industry news.

www.society-of-sports-therapists.org – The Society of Sports Therapists (SST) website gives easily accessible information about educational opportunities, careers, standards of care and regulatory guidance.

www.thesma.org – The Sports Massage Association (SMA) website contains information about the management of soft tissues to guard against, or recover from, a soft-tissue injury. It also gives guidance on finding a qualified practitioner.

Unit 12: Sociocultural Issues in Sport and Exercise

Delivery guidance

Approaching the unit

This unit gives learners the opportunity to consider the value of sport and exercise in our society, and the historical, social, cultural and ethical factors that impact on its development. This unit also allows learners to investigate the sociological theories that underpin the study of sport and society, how sport can be used to address social and cultural issues, and the relationship between sport, commercialism and the media.

You could deliver this unit using a mix of theory (to introduce learners to the topics listed in the unit content) and visits and guest speakers (to enable learners to apply the theoretical concepts they have learned). Learners will need to produce written reports that evaluate and justify sociological theories and the impact of sport and exercise in society.

Delivering the learning aims

Learning aim A

This learning aim requires formal teaching of the social theories used to study and interpret sport and exercise in society. Group discussion will enable learners to explore the different theories and to question their role in interpreting sport in society. You could cover these topics using a variety of methods, including formal lectures, independent research and learner's presentations. Tutor-led delivery may be used to further support theoretical understanding. Group work should be encouraged, using mini presentations to enable peer learning and personal knowledge checks.

Learning aim B

Learners need to investigate the historical and cultural changes, and the social and ethical issues that have impacted on sport and exercise development in the UK. You could cover Topic B1 by allowing learners to research the impact of the historical and cultural changes on a chosen sport. Research sessions will enable learners to develop key study and employability skills.

For Topic B2, you could ask learners to select a social and/or ethical issue in the UK and examine how this issue can be addressed through sport and exercise. Learners could present their findings as a slide presentation; this would enable learners to work in small groups or pairs and apply their research through selecting what information to present. This will also allow learners to learn from their peers and to gain experience of public speaking.

Learning aim C

Learners need to investigate the relationship between commercialism, the media and sport and exercise. To deliver this topic, you could use a variety of methods, including independent research, group presentations and role plays. You could

base role-play tasks around briefs that you have set to enable learners to explore the use of the media in promoting sport. Group discussion will enable learners to explore the interrelationships between the media and sport, and their impact on sports performers, spectators and on sport itself.

For Topic C4, learners may benefit from visits to different sports venues, to see how the media has affected the sport and society – the people involved within it, and how sport has become a commercialised product.

For Topics C5 and C6, learners could research popular sports events and present their findings as a slide presentation, or make a factsheet. This would enable learners to work in small groups or pairs to apply their research through selecting what information to present.

Learning aim	Key content areas	Recommended assessment approach
A Understand the social theories used to study and interpret sport and exercise in society	**A1** Functionalist theory **A2** Conflict theory **A3** Critical theory **A4** Figurational theory	A report that justifies the sociological theories used to interpret the role of sport in society
B Investigate the historical and cultural changes, and the social and ethical issues that have impacted on sport and exercise development in the UK	**B1** Historical and cultural changes on sport **B2** Social and ethical issues in the UK	A report that includes an evaluation of the impact of historical, cultural and social issues on the development of sport and exercise in the UK
C Investigate the relationship between commercialism, the media and sport and exercise	**C1** The use of media to promote sport **C2** The impact of media attention on sport, sports figures and spectators **C3** The impact of media attention on sports performers and spectators **C4** Sport and the performer as a commercialised product **C5** Globalisation of sport **C6** Balance between social issues and the globalisation of sport	A report that evaluates the impact of the media and commercialisation on the development of sport and exercise

Assessment guidance

This unit is internally assessed. Learners will be required to produce three assignments. There are a maximum number of three summative assignments for this unit.

To support a successful outcome, it will be beneficial for learners to practise preparing for their assignments so that they are familiar with what they are

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expected to produce. You should also ensure that the learners are familiar with the key terms typically used in assessment for this unit.

It is recommended that you follow the suggested assignment format detailed in the unit specification.

Learning aim A is to be assessed via a report or leaflet that summarises the theories used to study sport and society. The assignment could be constructed of two main topics. The first topic should focus on the view of functionalist and conflict theorists about how sport can be used in a positive way in society. The second topic should focus on figurational and critical theories, and how these viewpoints can help to explain how sport can be used to change society but also reflect changes in society. Examples from sport should be drawn on to illustrate these viewpoints.

Learning aim B is to be assessed via a report or presentation. The report or presentation should include an investigation of the impact of historical and cultural changes on sport; learners should also evaluate the use of sport to address issues in society. Learners could use examples and case studies to demonstrate the use of the law to deal with ethical issues in sport. The assignment could be split into three tasks. The first task should focus on historical changes to society and the impact on the development of modern sport. A specific relevant sport could be used to illustrate these impacts, for example, football. The second task should consider how sport is used to address issues identified in society, for example, racism or sexism. It could involve learners in participating in recognised campaign events and promoting positive values. The final task should focus on the use of the law to resolve ethical issues in sport; case studies should be used to illustrate the impact.

Learning aim C is to be assessed via a report. The report should investigate the impact of media attention and commercialisation on sport, sport figures and spectators, the commercialisation of a global spectator event and the use of a performer as a product. Examples of the use of media to promote sport, and its commercial products, could be drawn from major sponsors such as Nike or McDonalds.

Getting started

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

Unit 12: Sociocultural Issues in Sport and Exercise
Introduction Introduce the unit by discussing the value of sport and exercise in our society and the historical, social, cultural and ethical factors that have impact on its development. Explain that sport is not just about fun, health and fitness, but that a political and commercial agenda exists that continues to manipulate sport for the advantages it can bring. You should also outline the nature of the learning aims and the assessment tasks that learners will be expected to complete, using the unit specification as a resource.
Learning aim A – Understand the social theories used to study and interpret sport and exercise in society
• Outline the nature of learning aim. A good starter activity is a tutor-led discussion to engage learners, pulling out key points (with questioning where necessary) about

how sport and exercise contributes to society.

- Introduce learners to the functionalist theory. You could use formal delivery, with learners making notes on the key. Then engage learners in a discussion, pulling out the key points and, where necessary, using questioning about the importance of an active population.
- Introduce learners to the conflict theory. In small groups, ask learners to produce an annotated spider diagram that shows how sport is used as a form of control. You could then engage learners in a discussion, pulling out key points and, where necessary, using questioning about the conflict theory and its role in understanding sport in society.
- Introduce learners to the critical theory. Engage the class in a discussion about how sport can be used to bring about change in society. In pairs, ask learners to research the critical theory. They should then produce a slide presentation about their research, to present to the other groups in the next lesson.
- Introduce learners to the figurational theory. You could use formal delivery to introduce learners to the concepts involved in this theory. Working individually, learners could produce a factsheet about acceptable and nonacceptable behaviours in society. You might want to give learners access to the internet to help them complete this activity.
- Learners could spend a lesson reviewing the work covered in learning aim A. Using the internet, books, journals and magazines, learners should prepare notes for assignment 1.

Learning aim B – Investigate the historical and cultural changes, and the social and ethical issues that have impacted on sport and exercise development in the UK

- Outline the nature of the learning aim. Engage the group in a discussion about how a selected sport has changed and what has caused these changes, e.g., urbanisation.
- In pairs, ask learners to produce an annotated poster for a selected sport, showing how their selected sport has been affected by historical and cultural changes. Learners may need access to the internet to complete this activity. Learners could use the next lesson to present their annotated posters to the rest of the group.
- Introduce learners to social and ethical issues in the UK, and how these issues may be addressed through sport and exercise.
- In pairs, learners could select a social issue, such as discrimination or health promotion, in the UK and examine how it could be addressed through sport and exercise. Learners could present their findings as a slide presentation to the rest of the group in the next lesson.
- Introduce learners to ethical issues in sport. An interesting activity for learners would be to examine a range of newspapers and sports magazines, highlighting different stories/articles and identifying whether the story is about an ethical issue in sport, e.g., performer violence, dysfunctional spectator behaviour or match fixing. Learners could give feedback to the group with a brief summary of the story/article and which ethical issue it identifies. Then engage learners in a discussion, pulling out key points and, where necessary, using questioning about ethical issues and possible solutions.
- Learners could spend a lesson reviewing the work covered in learning aim B. Using the internet, books, journals and magazines, learners should prepare notes for assignment 2.

Learning aim C – Investigate the relationship between commercialism,

the media and sport and exercise

- Outline the nature of the learning aim and introduce learners to the use of media for promoting sport. Engage the group in a discussion about the different types of media and their use in sports. Ask learners about new technologies used to cover sport, and about how learners find out information about sport, e.g., from social media, internet and apps.
- In pairs, ask learners to identify the role of the media. Learners can produce a factsheet that identifies the different roles of the media and gives examples of how each media is used, e.g., to provide match reports, to educate or to entertain.
- Introduce learners to the interrelationship between sport and the media. Ask learners to write a 1000-word essay explaining the interdependent (symbiotic) relationship between sport and the media, whose view the media is representing and how the public perceives meaning from the images and messages received.
- Introduce learners to the impact of media attention on sport, sports figures and spectators. You could allocate individuals or pairs a topic and ask them to provide as many examples as they can, and then to give feedback to the rest of the group about their topics and examples. You could end the lesson by pulling out key points and, where necessary, using questioning about the impact of media attention on sport.
- An investigative task could be set to illustrate the impact of media attention and commercialisation on sport, sport figures and spectators. For example, coverage of men's and women's sport, or football versus hockey, or an investigation into participation figures for all sports compared against media coverage. This could be carried out in small groups or pairs.
- Introduce learners to the impact of media attention on sports performers and spectators. As an individual task, ask learners to review a named global spectator event. This could demonstrate the variety of forms of commercialism used, including a review of the ways in which performers were used in relation to the event, or at the time of the event, as a product.
- Introduce learners to the concept of sport and the sports performer as a commercialised product. You could engage the group in a discussion about the use of performers in advertising and endorsement of products to increase sales. Learners could provide examples from their chosen sports, e.g., foreign investors in their favourite sports team, or a sports player used in a new media campaign.
- You could arrange a visit to different sports venues for learners to see whether media coverage has affected sport, the public and the people involved in it. This would allow learners to investigate admission fees, concession fees, media rights and merchandising. Visit venues could be a local sports centre, a sports stadium or venue, a sports club.
- Introduce learners to the concept of the globalisation of sport, and the balance with social issues. In pairs, learners could research popular sports events and present their findings as a slide presentation, or make a factsheet. You may wish to select an event or sport for each group to research, e.g., the London 2012 Summer Olympics would enable learners to cover all the relevant issues. It would be useful for learners to make notes when peers are making their presentations.
- Learners could spend a lesson reviewing the work covered in learning aim C. Using the internet, books, journals and magazines, learners should prepare notes for assignment 3.

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

This unit links to:

- Unit 3: Applied Sport and Exercise Psychology
- Unit 5: Applied Research Methods in Sport and Exercise Science
- Unit 9: Research Project in Sport and Exercise Science
- Unit 14: Technology in Sport and Exercise Science

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Sport and Exercise Sciences. Check the Pearson website (http://qualifications.pearson.com/en/support/published-resources.html) for more information as titles achieve endorsement.

Textbooks

Adams M et al, *BTEC Level 3 National Sport and Exercise Sciences – Student Book*, Pearson, 2016 ISBN 9781292133959

Collins M, *Examining Sports Development,* Routledge, 2009 ISBN 9780415339902

Houlihan B and White A, *The Politics of Sport Development*, Routledge, 2002 ISBN 9780415277495

Hylton K et al, *Sports Development: Policy, Process and Practice*, Routledge, 2001 ISBN 9780419260103

Stafford-Brown J et al, *BTEC Level 3 National Sport and Exercise Sciences*(Fourth Edition), Hodder Education, 2016 ISBN 9781471878633

Journals

International Journal of Sport Management and Marketing

Journal of Sport, Education and Society – This journal has information about how sport is managed and commercialised. It will help learners to research learning aim C.

Sociology of Sport Journal – This journal has articles about sociocultural issues in sport. It will be useful for learners when writing their assessment tasks to find material about recent sports issues in society.

Websites

The websites below can be used by learners to research information about the role of sport in society and sociological issues.

www.cimspa.co.uk/ – The website of the Chartered Institute for the Management of Sport and Physical Activity contains information and articles about sport, commercialisation and globalisation.

www.olympics.org – The British Olympic Association website provides information about the history of the Olympic Games and about sport around the world.

www.pponline.co.uk – Peak Performance is the website of the Sports Bulletins; it contains information and archive articles about sport.
www.quest-uk.org – Quest provides information about sports development and sports issues, with links to other useful websites.

www.sportengland.org – The Sport England website provides information about sports initiatives and resources available in the UK.

Unit 13: Nutrition for Sport and Exercise Performance

Delivery guidance

Approaching the unit

This unit gives the learners an opportunity to explore how nutrition can affect a sports participant's performance positively or negatively, the importance of hydration and how to apply the nutritional principles. This unit also allows learners to focus on the concepts of nutrition and digestion, and the components of a balanced diet.

You could deliver this unit using a mix of theory (to introduce learners to the topics listed in the unit content) and visits and guest speakers (to enable learners to apply the theoretical concepts they have learned).

You should allow learners to investigate the different sporting demands on performers, and how their nutritional requirements and strategies will vary. Learners should be given the opportunity to apply their knowledge and understanding by adapting a realistic diet and hydration plan for selected athletes or sports performers, including justifications for their nutritional guidance.

Delivering the topics

Topic A

This topic requires a formal delivery of the basic principles of nutrition and fluid intake. For Topic A2 relating to macronutrients, learners need to know about the different food groups, their functions and how they are used by the body. To deliver this topic, you could use a number of methods that include formal lectures, independent research and group presentations. Research tasks can be based on different sporting demands for macronutrients. Group discussion will enable learners to think about their own sports performance and their macronutrient demands.

For Topics A3 and A4 relating to micronutrients and fibre, respectively, learners could research the functions and sources of micronutrients and fibre, the recommended daily intake (RDI) and the effects of deficiencies. Learners could use this information in a slide presentation to the rest of the group. Encourage learners to ask each other questions, and to use their notes from presentations to create revision materials.

Topic A5, dealing with fluid intake, could be covered with the use of cases studies. Learners could be introduced to scenarios that include information about the type of activity, level of activity and climate. Using this information, learners could recommend the type of fluid to be used for hydration, and the effect it could have on sports performance.

Topic B

Learners need to know the factors affecting the digestion and absorption of nutrients and fluids. This topic requires a formal teaching of all topics. You could

support learning by using a number of methods, including independent research, group discussions and videos on video sharing websites for examples of the function of digestion. The session times can be flexible, and can be included whenever there is an opportunity for the learners to carry out independent research. It is important that learners understand how to focus their research, and know how to reference the research in their own work.

Case studies will be useful to help learners to interpret information and apply their knowledge to scenarios for Topics B2 (hormonal control of blood sugar and water balance) and B3 (control of glycogen synthesis).

Topic C

You need to introduce the learners to the nutritional intake for health and wellbeing. To deliver this topic, you could use a number of methods, including formal lectures, independent research and group presentations. The research tasks can be based around case studies set by you to create a scenario that allows the learners to explore their knowledge of a balanced diet, its benefits for a sports performer and the effects of eating disorders. Allow the learners to share the results from their research at regular intervals to promote discussion, ask questions and review each other's work.

Topics C2 and C3 relating to 'benefits of a balanced diet' and 'eating disorders' could be delivered by a guest speaker. A nutritionist, a coach or a professional sportsperson would be able to offer their real-life experience and expertise about the application of a balanced diet for sports performance.

Topic D

For Topic D, you need to give the learners plenty of research experience. Learners need to be able to target their research to understand how to apply nutritional strategies for sports performance.

Learners need to know how nutritional strategies differ based on the demands of the sport/activity, and how supplements can support nutritional strategies.

To deliver this topic, you could use independent research and group presentations. Group discussion will also enable learners to explore the nutritional strategies based on the demands of different sports and during their different phases.

Assessment guidance

It is important that revision opportunities are put into clear contexts. Learners should be given an opportunity to use nutritional programmes and practise calculations related to working out the percentage of each macronutrient intake from the grams of each macronutrient provided in a nutritional programme. They should also learn how to interpret the programme in relation to health and wellbeing and provide modifications and nutritional strategies for a client who takes part in a specific sport or exercise-related activity to help to improve their performance. Foods and nutritional strategies that are beneficial to different types of sport and exercise performance should also be revised related to the three different phases of an event – pre event, during event and post event.

This unit is externally assessed. The external assessment lasts for three hours. Learners will be given personal details about a client including their age, gender, height, weight, BIA and activity levels. They will also be provided with the sporting event that the client takes part in and a set phase of training. The task booklet contains a current nutritional programme which lists the foods consumed over a week, the calories consumed each day and the grams of each macronutrient plus the activities the client typically takes part in.

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The external assessment takes place on a date and time set by Pearson, in a single session that lasts three hours.

The assessment evidence submitted to Pearson is three written activities completed in a task and answer booklet. The assessment evidence is produced under full formal supervision to ensure that learner work is authentic and that all learners have had the same assessment opportunity.

Learners will be provided with information on a client, a nutrition programme and an information booklet giving the food group of foods in the nutritional programme that learners may not be familiar with, the energy content of each macronutrient, the Harris Benedict equation to calculate BMR, activity level factors to multiply the BMR with and also the BMI equation.

To support a successful outcome, it will be beneficial for the learners to practise preparing for the assessment, so that they are familiar with the assessment controls and what they are expected to produce. You should also ensure that learners are familiar with the key terms typically used in the assessment for this unit.

Getting started

This provides you with a starting place for one way of delivering the unit. Activities are provided in preparation for the external assessment.

Unit 13: Nutrition for Sport and Exercise Performance
Introduction Start by explaining that this unit gives learners the knowledge and understanding of nutrition for sport and exercise performance.
Topic A – Principles of nutrition and hydration
Outline the nature of the topic and introduce learners to the principles of nutrition and hydration. • Using the specification, outline the nature of the topics and the assessment task that learners will be expected to complete. Explain the importance of the 'command words' typically used in the assessment and how these must be used for learners to demonstrate the necessary skills during their assessment. • Introduce learners to nutrition for sports and exercise science. You could engage learners in a discussion, pulling out key points and, where necessary, questioning them about nutritional measurements and units, and the recommended daily allowances (RDAs). • Ask learners to work in pairs to identify and discuss the importance of nutritional measurements and units, and the RDAs. Learners should focus on their own diets: any specific diets they follow, nutrients they consume and why; e.g., use of protein supplements, RDAs of vitamins and minerals and the role of the RDAs. • Draw together suggestions/ideas from each pair and identify common traits. Which nutrients do learners focus on consuming? Do they follow the RDAs for consumption? Which units and measurements are the learners familiar with? Do they know what these units measure? • Introduce learners to metabolism, basal metabolic rate (BMR), the Harris–Benedict equation and the effect of activity levels on BMR. Learners should be given worksheets, or use online calculators, to help them calculate their BMR. Learners should then calculate their own activity level and adjust their calorie intake by taking into consideration their activity level.

- Teach learners how to use anthropometric equipment and then give them time to record their energy intake and expenditure. They can then work in pairs, or small groups, to capture this information. Finish the lesson by summarising the methods used to calculate BMR and energy expenditure. Allow learners to discuss their activity levels in relation to their sports performance (selected sport and level of training/competition).
- Introduce learners to energy balance. Ask learners to work in pairs to research energy intake and expenditure, comparing two different performers over a set period (e.g., a week or a day). For both performers, learners should consider the type and duration of the sporting activity. You could allocate each pair, two different sports performers, or allow them to select their own. It may be useful for learners to produce a brief history for each performer, e.g., age, sex, selected sport, level of competition and time spent in action. At the end of the lesson, each pair should present their information to the rest of the group.
- Introduce learners to the body composition and the norm values for men and women. Ask learners to work in pairs to measure each other's body composition. Where possible, learners should have access to a sports science laboratory. You will need to show learners how to use the different equipment for measuring body mass index (BMI) and bioelectrical impedance analysis (BIA). You could finish the lesson by discussing the strengths and weaknesses of each method of testing body composition.
- Start the next lesson by writing a question on the board to engage learners upon entry into the classroom: 'What nutrients?' Follow this up by leading a discussion about learners' responses. Use formal delivery to explain the structure of carbohydrates, giving examples of sources, the RDA, their normal function in the body, and their function during sport. You should also include information about the glycaemic index.
- Introduce learners to fats. Engage learners in quick-fire 'true or false' questions to gauge their understanding of fats, e.g., 'fats make you fat', 'all fats are the same', 'vegetables contain no fat'.
- Use formal delivery to explain the structure of fats, giving examples of sources, the RDA, their normal function in the body, and their function during sport.
- Introduce learners to protein. You could start the lesson by displaying pictures of foods (or samples of food) for learners to say whether the food contains protein or not. Follow up by leading a discussion about foods that contain protein and the role of protein in the body.
- Introduce learners to the structure of protein, giving examples of sources, the RDA, their normal function in the body, and their function during sport. Learners should make notes, with examples, throughout the lesson. You could finish the lesson by summarising the importance of macronutrients and protein for growth and repair of muscles.
- Arrange for a guest speaker to explain their role and the role of nutrition, macronutrients in particular, in a sports performer's diet. The guest speaker could be a professional sportsperson, a sports coach or a nutritionist. Learners should work on their own to write up the notes they took, and answers to their questions, from the guest speaker's presentation.
- Introduce learners to micronutrients. Ask learners to work in pairs and research two micronutrients. You should allocate these to learners so that all micronutrients are covered. For each micronutrient, learners should research information about its function, the RDI, and what a deficiency of the micronutrient could cause. Learners should be prepared to present the information they have found in the next lesson.
- Introduce learners to fibre. Use formal delivery to explain the function, sources and

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the RDI of fibre. Ask learners to research their favourite foods, and investigate the fibre content. Learners should make an annotated list to show the foods and their fibre content, ordered from highest to lowest levels of fibre. Finish the lesson by summarising the importance of fibre, and giving sources of fibre.

- Introduce learners to the importance of fluid intake. Use formal delivery to explain the importance of maintaining hydration levels, the types of fluid used for hydration and their function. Use as many sports examples as possible to illustrate your delivery. Learners should take notes throughout. Next, ask learners to write down the sports and activities they take part in, and how they maintain hydration; e.g., 'I drink a 330 ml can of energy drink 30 minutes before playing football, and drink water afterwards'.
- Introduce learners to the effects of temperature of the fluid on the speed of rehydration, the effects of carbonated fluid on rehydration time and the RDI of fluids. You could ask learners to use the internet to research factors affecting the RDI and the effects of dehydration (hypernatraemia) and hyperhydration (hyponatraemia).
- Finish the lesson by drawing together the information learned from the previous activity, summarising the effects of dehydration and hyperhydration and the effect of climate on fluid intake.
- Allocate time for learners to write revision notes for Topic A. Learners should have access to computers with internet access, textbooks, journals and magazines.

Topic B – Factors affecting digestion and absorption of nutrients and fluids

This topic lends itself to formal delivery; learners could be involved by researching around the topics to develop their notes.

- Introduce learners to the basic principles and function of digestion. Learners should make notes throughout.
- Learners could use textbooks to expand their notes on the function of digestion. Learners could photocopy relevant information and diagrams and add these to their revision notes. Draw together the information discovered by individual learners.
- Introduce learners to the concept of the timing of digestion, absorption of fluids and the redistribution of blood flow during digestion.
- Ask learners to work in pairs and add to their notes by researching diagrams and information about the redistribution of blood flow during digestion and exercise, and how digestion can affect sports performance. Draw this information together, diagrams may be shared and information exchanged about how digestion can affect sports performance.
- Formally deliver the role of hormonal control of blood sugar levels and low/high levels of blood sugar.
- Formally deliver the role of hormonal control of water balance, dehydration and hyperhydration.
- Again, you could formally deliver information on the types of food and the timing of food intake to maximise glycogen synthesis. You could lead learners in a discussion about the types of food that would be suitable for an athlete during training, competition and after an event.
- You should allocate time for learners to write revision notes for Topic B. Learners should have access to computers with internet access, textbooks, journals and magazines.

Topic C – Nutritional intake for health and wellbeing

- Introduce learners to a balanced diet and the importance of eating a balance of food groups. Ask learners to create a template that they can use to maintain a food diary for a week. The template should include the day and time, the food eaten, the amount of food and the main food groups it contained. Ask learners to fill in their food diary with the types of food they have eaten during the week and bring it to the next lesson. Also ask learners, where possible, to bring in any food wrappers from the food they have eaten.
- Using the food wrappers collected, learners should complete their food diaries for the week by adding the nutritional information from the wrappers against the food eaten. The wrappers will allow learners to gain accurate information about the food groups, calories and amount of food they have eaten. Learners should share the food wrappers so that they can complete their food diaries. Learners should investigate whether they eat a balanced diet, and which food groups they eat too much or too little of.
- Introduce learners to the food pyramid and eatwell plate. Show learners examples of each – what they explain, and how. Ask learners, in pairs, or individually, to produce two annotated posters, one with information about the food pyramid and another about the eatwell plate. Learners can annotate their posters by using information from the food wrappers collected and used in the previous lesson.
- Introduce learners to the impact of food preparation on the nutritional composition of food. Ask learners to research the nutritional composition of common foods, depending on their preparation, e.g., potatoes – boiled, raw, fried as chips, roasted and baked. Learners should make a factsheet with this information leaving space to add information about the taste, appearance and the ease of consumption of the food.
- If possible, give learners the opportunity to taste the foods and try to see what food preparation does to different foods. Learners should prepare the food themselves, e.g., boil, bake and fry eggs. Learners should add notes to their factsheets describing the effect of food preparation. For example, Is the food edible (a raw egg is not very palatable)? Could the food be taken to training, and easily eaten before a training session?
- Introduce the benefits of a balanced diet, including information about weight maintenance and reduced risk of disease. Ask learners to work in pairs to research the benefits of a balanced diet for a sportsperson. Learners should produce notes that they can use to revise for their assessment.
- Arrange for a guest speaker to explain the benefits of a balanced diet. The guest speaker could be a professional sportsperson, a sports coach or a nutritionist. Working on their own, learners should write up the notes they took, and answers to their questions, from the guest speaker's presentation.
- You could also arrange for a different guest speaker to explain the definition of eating disorders and the effect of anorexia nervosa, bulimia nervosa and overeating on health. The guest speaker could be a nurse, a doctor or nutritionist. Again, ask the learners to work on their own to write up the notes they took, and answers to their questions, from the guest speaker's presentation.
- Ask learners to research an eating disorder such as anorexia nervosa, bulimia nervosa or overeating, and their effects on health. Learners should add this information to the notes they made during the guest speaker's presentation.
- Allocate time for learners to write revision notes for Topic C. Learners should have access to computers with internet access, textbooks, journals and magazines.

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Topic D – Nutritional strategies for sports performance

- Introduce learners to the nutritional demands of different sports. Ask learners to discuss nutritional strategies that they have either used or know about. Which sports activities favour specific nutritional strategies? How are these administered?
- Ask learners to work in pairs to research and make notes on carbohydrate/glycogen loading, and the effect of increased protein intake. Learners should produce information that includes specific sports examples, instructions about how the nutritional strategy is applied, and its benefits to sports performance.
- You could present information about how nutritional strategies can be used by selected sports people to achieve weight loss or weight gain, using examples from a range of different sports to demonstrate how these strategies can be applied. Ask the learners to work in pairs and investigate why sports people would use a nutritional strategy to gain or lose weight. Learners should annotate their notes with specific sports examples.
- Introduce learners to the application of nutritional strategies for an endurance event. Ask the learners to work in pairs to produce a nutritional strategy for an endurance event. The strategy should include the name of the sport and the performer's information (age, height, weight, activity level). Learners should consider the types and amounts of food required.
- Introduce learners to the application of nutritional strategies for a strength/power event. Ask the learners to work in pairs to produce a nutritional strategy for a named strength/power event. The strategy should include the name of the sport and the performer's information (age, height, weight, activity level). Learners should consider the types and amounts of food required.
- Introduce learners to the application of nutritional strategies to meet/maintain a target weight category for a named activity. Ask the learners to work in pairs to produce a nutritional strategy to meet/maintain a target weight category. The strategy should include the name of the sport and the performer's information (age, height, weight, activity level). Learners should consider the types and amounts of food required.
- Introduce learners to the effect of using supplements on the body, and the health benefits to sporting performance. Ask the learners to work in pairs and use the internet to research one of the following:
    - caffeine
    - creatine
    - energy gels/glucose tablets
    - protein shakes/powders
    - beetroot juice
    - diuretics
    - vitamin supplements
    - branched-chain amino acids (BCAA).

  Learners should consider the positive and the negative effects of the supplement on sports performance, its cost, availability and practical use. Using their research, learners should produce a factsheet to present to the rest of the group. Finish the session by drawing together the information from the paired activity.
- Introduce the learners to the World Anti-Doping Agency (WADA). It may be useful to show learners the WADA website, and competition rules about banned substances. Ask learners to research the WADA and national governing body

regulations for banned substances for a sport of their choice. Learners should use this information to produce a short slide presentation to show to the rest of the group.

- Introduce the learners to the importance of nutritional intake during different phases of an event. Use different examples from a range of sports to show how nutritional requirements change, depending on the activity level, its duration and the climate. Ask learners to produce a plan to show how nutritional requirements may change for a specific sportsperson. For example, a learner could research the nutritional requirements for a rugby league player before, during and after a match.
- To prepare the learners for their assessment, you could give them different case studies to practise applying nutritional strategies. You should refer to the sample assessment materials (SAMs) provided by Pearson for an example case study. Case studies should include the sports performer's information (age, gender, height, weight, BIA and activity levels), and their current nutritional programme.

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

This unit links to:

- Unit 1: Sport and Exercise Physiology
- Unit 2: Functional Anatomy
- Unit 6: Coaching for Performance and Fitness
- Unit 8: Specialised Fitness Training
- Unit 10: Physical Activity for Individual and Group-based Exercise
- Unit 11: Sports Massage
- Unit 15: Sports Injury and Assessment

Resources

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

Textbooks

The following textbooks will be a useful reference source for learners when researching information about nutrition and its impact on sports performance.

Adams M et al, *BTEC Level 3 National Sport and Exercise Sciences – Student Book*, Pearson, 2016 ISBN 9781292133959

Bean A, *Sports Supplements*, A&C Black, 2007 ISBN 9780713682595

Burke L, *Practical Sports Nutrition*, Human Kinetics, 2007 ISBN 9780736046954

Food Standards Agency, *Manual of Nutrition* (12th Edition), Her Majesty's Stationery Office, 2012 ISBN 9780113229291

Griffin J, *Food for Sport: Eat Well, Perform Better*, Crowood Press, 2001 ISBN 9781861262165

Karinch M, *Diets Designed for Athletes*, Human Kinetics, 2002 ISBN 9780736038348

Larson-Meyer DE, *Vegetarian Sports Nutrition*, Human Kinetics, 2006 ISBN 9780736063616

Manore M, Meyer N and Thompson J, *Sport Nutrition for Health and Performance*, Human Kinetics, 2009 ISBN 9780736052955

McArdle W and Katch FI, *Sports and Exercise Nutrition*, Lippincott, Williams and Wilkins, 2008 ISBN 9780781770378

Rinzler CA, *Nutrition for Dummies* (Sixth Edition), For Dummies, 2016 ISBN 9781119130246

Stafford-Brown J and Rea S, *BTEC Level 3 National Sport and Exercise Sciences* (Fourth Edition), Hodder Education, 2016 ISBN 9781471878633

Journals

The following journals will allow learners to access information about current trends in sports nutrition, as well as being a good reference source for information about sports nutrition, the effects of poor nutrition and the effect of diet plans in improving sports performance.

British Journal of Nutrition

British Medical Journal

International Journal of Sport Nutrition and Exercise Metabolism

Journal of the International Society of Sports Nutrition

Journal of Nutrition

Websites

The following websites can be used by learners to research information for tasks, both during the delivery of this unit and for producing revision notes for the external assessment.

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

www.foodstandards.gov.uk – Food Standards Agency

www.ifr.ac.uk – Institute of Food Research

www.lucozadesport.com – This website may be useful to show learners the different types of fluid available for athletes to buy, and the possible effects on their performance.

www.nutrition.org.uk – British Nutrition Foundation

www.wada-ama.org – WADA's website contains information about how the agency monitors international level sport.

Unit 14: Technology in Sport and Exercise Science

Delivery guidance

Approaching the unit

This unit gives an overview of the use of technology in sport and exercise, its impact on performance, the measurement of performance and the ethical considerations associated with its use.

The unit gives the learners knowledge of the impact of technology on sport and exercise. It will allow learners to explore the types of technology and personal equipment available to sport and exercise performers, and to investigate how technology aids sport and exercise performance. Learners will examine how technology is used to measure and analyse sport and exercise performance, and they will consider the ethical implications that have an impact on the use of technology in sport and exercise.

Initially, you could deliver this unit using a mix of theory (to introduce learners to the topics listed in the unit content) and visits and guest speakers (to enable learners to apply the theoretical concepts they have learned). Learners will need to produce presentations and written reports and demonstrate their knowledge and understanding of this unit.

Delivering the learning aims

Learning aim A

This learning aim could be covered through a number of methods such as independent research, visits and the use of guest speakers. Tutor-led delivery may be used to further support theoretical understanding of Topic A5, to enable learners to gain an understanding of why certain technologies are selected. Group work should be encouraged, using mini presentations to enable peer learning and personal knowledge checks.

Group discussion will enable learners to reflect on the types of technology used in sport, the technology worn by the sports performer and the personal equipment used in a range of sports.

Learning aim B

To deliver this learning aim, you could use a number of methods such as independent research, group presentations, guest speakers and visits, to enable learners to explore the technologies used to develop sports performance.

Guest speakers could give an insight into data collection and performance analysis. They could talk about the methods and technology they have used to measure and analyse their sports performance.

Visits to sports centres and facilities will give learners an opportunity to understand and, if possible, to use data collection and performance analysis equipment and the different technologies used to simulate conditions.

Learning aim C

For this learning aim, you could use a number of methods such as independent research, group presentations, visits and practical sessions. For Topic C1, learners would benefit from a formal delivery of the development of technology used in sport, including equality of different technologies, ethical barriers to the use of technology and the role of governing bodies in regulating the use of technology.

Topic C2 requires learners to understand the ethics of using technology in sport, so that they can evaluate their impact. Learners should be given the opportunity to carry out independent research into sources of funding and sponsorship, and the cost and availability so that they can make informed evaluations.

Learning aim	Key content areas	Recommended assessment approach
A Investigate technology to aid sport and exercise performance	**A1** Types of technology used in sport **A2** Technology that is worn by the sports performer **A3** Personal equipment that is used by the performer **A4** Facilities that are used by the sports performer **A5** Reason for selection of sports technology	A presentation that evaluates the impact of personal technology equipment and sporting environments on sporting performance
B Explore technology to develop sport and exercise performance	**B1** Technology for data collection **B2** Technology for performance analysis **B3** Technology for simulated conditions	A report that evaluates the impact of technology and the resulting data collection on sports performance
C Understand the ethics of using technology in sport	**C1** Ethics of the development of technology used in sport **C2** Ethics of the use of technology in sport	A report that evaluates the impact of the ethics of using technological advancements in sports training and competitions

Assessment guidance

This unit is internally assessed. There is a maximum number of three summative assignments for this unit. It is recommended that you follow the suggested assignment format detailed in the unit specification.

To support a successful outcome, it will be beneficial for the learners to practise preparing for their assignments, so that they are familiar with what they are expected to produce. You should also ensure that the learners are familiar with the key terms typically used in assessment for this unit.

Learning aim A is to be assessed via a presentation that evaluates the impact of personal technology equipment and sporting environments on sporting

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performance. Learners must ensure that they evaluate how personal sports equipment technology impacts on sports performance, and how sports environments impact on sports performance. Learners should include an explanation of why selecting an appropriate personal sports equipment and sporting environments can affect sports performance, and go on to analyse and evaluate the impact of personal sports equipment selection on sports performance.

Learning aim B is to be assessed through a report that evaluates the impact of technology and the resulting data collection on sports performance. Learners must include a thorough description of how technology is used to collect data to measure sports performance. They should provide an explanation of how data collection can be used to enhance sports performance and set specific goals for sports performers. Learners should then analyse the impact of using data collection on sports performance, how sports environments can be simulated and performance analysed to improve skills and increase success.

Learning aim C is to be assessed through a report that evaluates the impact of the ethics of using technological advancements in sports training and competitions. Learners must include an explanation and an analysis of how ethics impact on the use of technology in training and competition situations. To complete the assignment, learners need to make a justification of the ethics of using technology in sport and exercise activities.

Getting started

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

Unit 14: Technology in Sport and Exercise Science
Introduction Introduce the unit by showing learners video clips of sports people using different types of technologies. Allow learners to see different sports activities, venues, facilities, equipment and performers using the technology. Explain how this unit will give them knowledge of the technology used in sport and exercise that will enable them to evaluate the ethics of using technology in sport. Outline the nature of the learning aims and the assessment tasks that the learners will be expected to complete. Use the unit specification as a resource.
Learning aim A – Investigate technology to aid sport and exercise performance
• A good starter activity is a tutor-led discussion to engage learners, pulling out key points (with questioning where necessary) about types of technology used to aid sport and exercise performance. • Introduce learners to the types of technology used in sport. Learners can then take part in a discussion about the different types of technology used in sport. Ask learners to work in pairs and allocate each pair a different type of technology to investigate. Learners should include information about the benefits of using their given technology. Each pair should produce a slide presentation, which they will deliver to the rest of the group in the next lesson. • Introduce learners to technology that is worn by the sports performer. A good starter activity is to ask learners to write down an example of a piece of technology worn by a sports performer, on the whiteboard as they enter the room. When you

have a list of different types of clothing and sporting footwear, you could ask learners to identify their purpose, e.g., technical clothing helps to keep the performer dry and warm. You could then develop this idea by asking learners to select a specific sport and write about the types of technical clothing and footwear their sport needs, and its purpose. For example, a swimmer needs to be streamlined in water, so they may use a swimsuit designed to reduce resistance to the water, and wear a swim cap to reduce the drag/resistance produced by their hair. You could finish the lesson by asking learners to find video clips of performers using their selected pieces of technology, which can then be shown to the whole class.

- Introduce the learners to personal equipment that is used by the performer. Learners should also be given examples of equipment that is not a requirement of the sport/activity. You could arrange a visit to a local venue or facility. Learners could prepare a series of questions focusing on personal equipment used by the sports performer. Examples of potential visits are:
  - a venue where sports people train, e.g., an athletics track or a swimming pool
  - a major sports centre
  - a semi-professional or a professional sports club.

  The visit should allow learners to observe the sports performers using personal technology in different sports activities and situations. You could combine the visit to cover Topic A4 and visit a facility or facilities that have different types of technology, e.g., controlled climates, climbing walls or artificial playing surfaces.
- Another way to deliver the topic of facilities used by the sports performer could be to ask learners to work in pairs or small groups to research different types of sports facility. Learners could use this information to produce a slide presentation, a factsheet or a worksheet for their peers. When carrying out their research about the different facilities, learners should consider:
  - their use during training and sports performance
  - the types of facilities
  - the development of the facilities
  - the benefits of using the facility.

  You could ask learners to draw from examples in their own area or worldwide.
- Introduce learners to the reasons for selecting sports technology. Engage learners in a discussion about why equipment has changed and how it is developed by using technology. Learners should be encouraged to exchange ideas about examples of technology in a range of sports; e.g., design of equipment that has been enhanced due to improved materials (such as poles used for pole vaulting or running shoes used for sprinting).
- Next, you could ask learners to work in pairs. Give each pair a reason for selecting a specific sports technology and ask them to produce a poster that explains their reason for this selection. They should provide a range of examples to illustrate their ideas. You could also allocate pairs a reason, or a specific example of a reason, for selecting sports technology. Learners may find it useful to have access to the internet, or to use magazines and newspapers to help them research examples.
- Learners could spend a lesson revising the work covered in learning aim A. Using the internet, books, journals and magazines, learners should prepare revision notes for assignment 1.

Learning aim B – Explore technology to develop sport and exercise performance

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- Where possible, this topic should be delivered within practical sports sessions. Learners would benefit from using data collection technology, technology for performance analysis and technology for simulated conditions.
- Introduce learners to the technology used for data collection. You could engage the learners in a discussion about these types of technology: whether they have used any of them or seen any being used, and for what purpose.
- You could arrange practical sessions for learners to use different types of data collection technology. You might have some of these equipment in your centre, or access to a local gym or sports centre, or you could arrange a visit to a local sports club (semi-pro or professional) to use their equipment. Where possible, learners should be allowed access to a range of equipment and technologies.
- If possible, you could arrange for learners to use different types of data collection technology in a range of sports activities and then ask them to analyse their data. You could use data either from the whole class or from a selected learner for analysis.
- Again, practical sessions would be beneficial for Topics B2 and B3. You could introduce learners to the types of technology used for performance analysis and for simulating conditions by showing clips on video sharing websites. However, it would be more useful to learners if they were able to use these technologies.
- You could arrange for a visit to a local gym or sports centre, or arrange a visit to a local sports club (semi-pro or professional), to use their equipment. Ideally, learners should have access to:
  - performance analysis technologies
  - video analysis technology, such as Dartfish
  - focus performance innovation
  - Prozone™
  - application software, e.g., heart rate (HR) monitors.
- It would be useful to visit a centre that has technology for simulating conditions, e.g., virtual replay technology or an indoor golf simulator.

  If you are unable to carry out centre visits and do not have access to these types of technology, learners could work in pairs to research a range of technologies. Using the information acquired in their research, they should explain the use of the technologies in sport and give feedback to the rest of the group, or produce a slide presentation. Alternatively, you could arrange for a guest speaker to demonstrate the technology and discuss why they use it, and how it has improved their sports performance. Some examples of guest speakers are professional or semi-professional sports people and coaches.
- Learners could spend a lesson revising the work covered in learning aim B. Using the internet, books, journals and magazines, learners should prepare revision notes for assignment 2.

Learning aim C – Understand the ethics of using technology in sport

- You should use a formal delivery to cover the ethics of the development of technology used in sport. You could use video clips to support your delivery, and should use examples from a range of sports and sporting events. Learners could then discuss the recent developments in technology used in their chosen sport. You should then extend this discussion by evaluating the cost and fairness of these developments, e.g., artificial pitches are expensive and not all sports clubs can afford them.

- Next, you could ask learners to work in pairs. They should select a sport and research the ethics of the development of technology in their chosen sport. Learners must consider the cost of development, its use, barriers to its use and whether there are any sports governing body regulations about its use. Learners could present this information as an annotated poster, a slide presentation or a factsheet, so that they can give feedback to the class in another lesson.
- Introduce learners to the ethics of using technology in sport. You could use local examples of sources of funding and sponsorship, and the facilities in your area for different sports and activities.
- You should give learners the opportunity to carry out independent research into sources of funding and sponsorship, and the cost and availability of equipment and technology, and the access to it. Learners should also consider any geographical considerations around funding and access. Learners will need access to technology and facilities, to enable them to make informed evaluations about the ethics of using technology in sport.
- Learners could choose to research one specific sport or a range of sports in one area or UK wide. Learners should be encouraged to weigh up both sides of the ethical arguments, such as: 'Is it fair that not everyone can get sponsorship? Does it make you train and perform harder if you are looking for a sponsor? Does it matter that equipment is not available to everyone? Is it a 'level playing field' if someone competes in a tennis tournament with the best technologically advanced tennis racket but their opponent has one that is 10 years old?' It will be useful for learners to make notes from their research task to help them to prepare for assignment 3.
- Learners could spend a lesson revising the work covered in learning aim C. Using the internet, books, journals and magazines, learners should prepare revision notes for assignment 3.

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

This unit links to:

- Unit 4: Field- and Laboratory-based Fitness Testing
- Unit 6: Coaching for Performance and Fitness
- Unit 7: Biomechanics in Sport and Exercise Science
- Unit 8: Specialised Fitness Training
- Unit 9: Research Project in Sport and Exercise Science
- Unit 10: Physical Activity for Individual and Group-based Exercise
- Unit 12: Sociocultural Issues in Sport and Exercise
- Unit 15: Sports Injury and Assessment

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Sport and Exercise Sciences. Check the Pearson website

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(http://qualifications.pearson.com/en/support/published-resources.html) for more information as titles achieve endorsement.

Textbooks

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

Adams M et al, *BTEC Level 3 National Sport Teaching Resource Pack*, Pearson, 2010 ISBN 9781846906541

Collins M, *Examining Sports Development*, Routledge, 2009 ISBN 9780415339902

Houlihan B and White A, *The Politics of Sport Development*, Routledge, 2002 ISBN 9780415277495

Hylton K et al, *Sports Development: Policy, Process and Practice*, Routledge, 2001 ISBN 9780419260103

Stafford-Brown J et al, *BTEC Level 3 National Sport and Exercise Sciences* (Fourth Edition), Hodder Education, 2016 ISBN 9781471878633

Journals

International Journal of Sport Management and Marketing – This journal has information about how sport is managed and commercialised. It will help learners to research learning aim C, the ethics of using technology in sports training and competitions.

Journal of Sport, Education and Society – This journal will be useful for learners and will help them to find information about the types of technology used in sport, training and competitions.

Videos

Clips on video sharing websites of athletes using technology in sport; for example, paralympians, athletes using fitness testing equipment or carrying out performance analysis.

Videos to show technology in use at facilities and venues; for example, stadium roofs opening and closing or artificial water sports courses.

Websites

The websites below can be used by learners to research information about the different types of technology used in sport, during training and competition.

www.bbc.co.uk/news/technology – BBC technology website

www.lboro.ac.uk/research/sti – Loughborough University's Sports Technology Institute

www.olympics.org – The official website of the Olympic Movement provides information about the history of the Olympic Games, and about sport around the world

www.paralympic.org – The Paralympic Movement website

www.paralympics.channel4.com – Channel 4's official Paralympic broadcasting website

www.paralympics.org.uk – The British Paralympic Association.

www.quest-uk.org – Quest provides information about sports development and sports issues, with links to other useful websites.

www.sportengland.org – The Sport England website contains information about the sports initiatives and resources available in the UK.

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Unit 15: Sports Injury and Assessment

Delivery guidance

Approaching the unit

This unit gives the learner an opportunity to understand different sports injuries, their symptoms, aetiology and mechanisms of injury to effectively administer treatment and develop a functional rehabilitation programme. It will also allow learners to explore injury risk reduction through effective preventative measures. Learners can review and discuss their own experiences of injury, treatment and rehabilitation. This review and discussion process should be engaging. This can be achieved by using specific and informative examples – case studies and scenarios, information from video sharing websites, television and news articles. A variety of visual aids, including posters, x-rays and anatomical models may also be useful while some aspects may be delivered practically.

The treatment of injury must be based on practice. It should allow plentiful opportunities for learners to explore and become confident and effective in the application of all treatment methods in a range of situations, with aspects of rehabilitation also delivered practically, to engage learners and reinforce learning.

Delivering the learning aims

Learning aims A and B

Learning aims A and B focus on acute and overuse sports injuries, mechanisms of injury, and the associated physiological and psychological responses. You should discuss injuries in relation to their mechanisms, and the signs and symptoms. You could use a combination of formal lectures and a learner-centred approach – for example, individual or group research based on the use of the internet and textbooks. Learning can be reinforced by watching video recordings or clips on video sharing websites, with small group discussions and completion of worksheets focusing on an injury overview, mechanism of injury, and signs and symptoms.

Physiological and psychological response to injury, as well as rehabilitation adherence factors, can be achieved through a combination of learner-directed research, discussion of learner experiences, use of video clips and inviting guest speakers from 'semi/elite/pro' athletes who have sustained injuries. Ask guest speakers to give first-hand descriptions of how they have coped with their injury and the help they received; allow time for a question and answer discussion. You should deliver the theoretical knowledge to further support learners' understanding. The theoretical knowledge provides the underpinning framework for learners to apply to sport and sports injuries. It is essential that the theoretical components, for example, psychological models, gait analysis and rehabilitation protocols are fully understood and learning is checked, to provide a sound framework for learners to apply in a practical context. Delivery should be tutor-led via lectures and the use of power point engaging the learner with visuals such as diagrams, pictures and question and answer. Learning can be

checked via group work with mini presentations encouraging peer learning, peer review and personal knowledge checks.

Learning aim C

For learning aim C, intrinsic and extrinsic injury risk factors could be explored through a learner-centred research approach. Research may be in the form of the internet, books, watching video clips, observing sporting games and class visits to sports events and environments. You could set group and individual tasks, with information pooled within the group, to encourage peer learning and to consolidate learner's understanding. An example of a group task could be to identify all intrinsic and extrinsic risk factors, and the appropriate preventative measures. Learners could use specific sporting examples to discuss specific intrinsic and extrinsic risk factors, and to explore preventative measures.

There should be a focus on gait analysis and associated biomechanical abnormalities, and how preventative measures can be introduced to reduce the risk of injury. A short tutor-led session should introduce theoretical aspects, and their practical application, through the observation of a range of gaits, such as antalgic, drop foot and Trendelenburg gait. Learners' gaits and digital recordings could also be used.

Formal delivery should be used to introduce the sequence of injury prevention models (Van Mechelen et al. 1992 or Van Tiggelen et al. 2008). You can confirm understanding through question and answer sessions. You should provide scenarios for learners to explore the application of the injury prevention model. Mini presentations can be used to encourage peer learning and personal knowledge checks.

Realistic examples are always a good way to promote learner engagement and guest speakers with responsibility for sports injury management, such as sports and rehabilitation therapists, physiotherapists, sports coaches, sports management staff or a member of St John Ambulance can be invited.

Learning aim D

For learning aim D, a live demonstration of common treatment methods is effective for initial delivery, followed by learners engaging in practical activities. You could record these activities and play the recordings continuously as a visual aid/reference point whenever learners are practising their skills. You might also consider engaging the support of a qualified first aider if you are not qualified yourself. Learners should explore application of their practical skills through role play and/or a range of scenarios to allow the development of confidence and effective application.

Learners need to explore theoretical aspects of rehabilitation through formal delivery, group work and practical application of theory. Methods of rehabilitation and progression should be delivered practically, allowing learners to explore the application of theory to practice.

You can use on the spot quizzes during practical activity and oral questioning to help learners apply the information they have learned to the scenario.

To explore real-life examples of rehabilitation programmes further, you should invite guest speakers from the industry, such as sports and rehabilitation therapists and physiotherapists. Discussion should include the appropriateness of programmes to the individual sports performer, why and how the programmes meet the aims and goals. Justify the application of theoretical components such as rehabilitation principles, factors that may affect rehabilitation, possible adaptations and alterations along with any recommendations or considerations

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the learners make. The accuracy of the rehabilitation plan and the appropriate use of terminology are central to gaining the highest grades.

Learning aim	Key content areas	Recommended assessment approach
A Understand acute and overuse injuries, their associated signs and symptoms and mechanisms of injury	**A1** Acute injuries **A2** Overuse injuries **A3** Mechanisms of injury	An evaluative report focusing on acute and overuse injuries, including signs, symptoms and examples of mechanisms of injury. An evaluation of a range of mechanisms for sport injuries and physiological and psychological response to injury and rehabilitation, use of specific examples will also be evident.
B Examine the physiological and psychological responses to injury and rehabilitation	**B1** Physiological response to injury **B2** Psychological response to injury **B3** Psychological factors associated with sport injury rehabilitation adherence	
C Investigate aetiology of sports injuries and their associated prevention strategies	**C1** Aetiology and prevention **C2** Gait analysis **C3** Preventative measures	A presentation focusing on intrinsic and extrinsic risk factors, gait analysis and the addressing of prevention and treatment of injury, as well as analysis of sequence of prevention model
D Explore common treatment and rehabilitation methods	**D1** Treatment methods and the need for medical referral **D2** Principles of rehabilitation **D3** Methods of rehabilitation	Effective and confident application of a range of common treatment methods, and oral questioning with regard to medical referral in response to given case study scenarios Development and justification of a rehabilitation programme in response to a given case study scenario A report focusing on the importance of sports injury management to sports performers

Assessment guidance

It is recommended that you follow the suggested assignment format detailed in the unit specification.

Learning aims A and B will be assessed by an evaluative report. Common sports injuries, their associated signs and symptoms, and mechanisms of injury will be addressed. The learner will proceed to address the physiological and

psychological responses to injury, making specific reference to the stage of injury. Psychological factors specifically associated with sport injury and rehabilitation adherence will also be explored. When presenting the report, the learner should be encouraged to use headings, sub-headings and annotation, such as pictures and diagrams, to support explanations. You should refer to the assessment guidance in the unit specification for specific detail.

The second assessment will address learning aim C, and it is suggested that this be in the form of a presentation. The presentation will investigate the aetiology of sports injuries and prevention strategies. Intrinsic and extrinsic risk factors, and analysis of gait will be explored and an understanding shown of the interrelationship with preventative strategies. The stages or the sequence of prevention model(s) will be carefully considered, drawing conclusions and detailing specific examples. You should refer to the assessment guidance in the unit specification for specific detail.

Assignment 3 will focus on the assessment of D.P4, D.M4, D.P5, DM.5 and D.D3.

Assessment of D.P4 and D.M4 must be practical in nature. You will create four contrasting scenarios to allow the breadth of the content to be addressed, for example, unconscious casualty, treatment for bleeding and shock, fracture and sprain/strain. In a simulated environment, the learner will apply appropriate treatment methods and protocols to the scenario, for example, first aid, PRICED, SALTAPS and other treatment methods such as bandaging. You will use oral questioning to ascertain and confirm knowledge, if required, regarding medical referral. As this is a practical assessment, you should ensure you adhere to any requirements regarding digital recording for standards verification purposes.

The learner will choose one scenario to use for the assessment of D.P5 and D.M5. You must ensure that the learners understand that they need to choose a scenario that will allow the breadth of the content for rehabilitation to be addressed. The learner will construct an appropriate rehabilitation programme. While there is no requirement for this to be implemented practically to attain D.M5, the programme must be safe, which is determined as fit for use in a realistic working environment. To ensure this, specific detail as stated in the essential information for assessment guidance section of the specification must be included. Adaptations and appropriate alterations should be comprehensively detailed. For D.D3, the learner is required to justify the rehabilitation programme design, including consideration of factors that may affect rehabilitation, future recommendations and considerations.

Getting started

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

Unit 15: Sports Injury and Assessment
Introduction Introduce the unit to your learners by designing a quiz on sports injuries, which incorporates the use of an injury clip (e.g., from video sharing websites). This enables you to assess previous learning and is a fun way to engage learners. Outline to the learners that the unit explores common sports injuries and that through sporting footage they will explore aetiology, mechanisms of injury, signs and symptoms, and the associated physiological and psychological responses to injury. Explain that they will be equipped with the practical skills to apply common treatment methods to a

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Unit 15: Sports Injury and Assessment

range of sporting injuries, and to explore rehabilitation methods and programmes. This unit will also give them a good understanding of how to identify injury risk factors and introduce preventative measures.

Differentiation is essential during the delivery process. Understanding and knowing your learners will enable you to do this effectively. For this ensure that the groups are of mixed abilities and to allow achievement, all tasks should be of a mastery and developmental nature, stretching the more able learners. Attention should be paid to the Bloom's taxonomy verb usage such as describe, explain, assess, analyse; and you should develop your level of questioning appropriately with each learner. During peer review, problem solving should be encouraged in addition to the evaluation and review process.

Learning aim A – Understand acute and overuse injuries, their associated signs and symptoms and mechanisms of injury

Learning aim B – Examine the physiological and psychological responses to injury and rehabilitation

- Introduce the topic and content of learning aim A to your learners with regard to acute and overuse injuries, and mechanisms of injury. Learners will then take part in a discussion about their own experiences of sports injuries.
- Provide an overview of acute injuries and introduce all categories detailed in the specification content. This should be presented in a visual way, using real-life examples, video clips and photographs. Discussion should follow to engage learners in exploring possible signs and symptoms, aetiology and mechanisms of injury.
- For each acute injury, you should give learners a worksheet with columns headed: aetiology, mechanisms, and signs and symptoms. In small groups, learners research each injury to complete their worksheets. Each group selects one or two injuries to present to the other groups. (Each group should choose different injuries to avoid repetition.)
- Provide an overview of overuse injuries and introduce all categories detailed in the specification content. This should be presented in a visual way, using real-life examples, video clips and photographs. Discussion should follow to engage learners in exploring possible signs and symptoms, aetiology and mechanisms.
- For each overuse injury, you should give learners a worksheet, with columns headed: aetiology, mechanisms, and signs and symptoms. In small groups, learners research each injury to complete their worksheets. Each group selects one or two injuries to present to the other groups. (Each group should choose different injuries to avoid repetition.)
- You should ensure that there has been full coverage of the unit content for mechanism of injury, and confirm learners' understanding through question, answer and discussion.
- Divide the group into research teams. Ask each team to research the following areas: grief response model, cognitive appraisal model, three categories of response, stress injury model (Williams and Anderson, 1998), the Wiese-Bjornstal integrated model and stress response. The team should consider each model and provide examples of application to their own injuries or that of a famous sportsperson. Ask the research teams to feed back their findings in the form of a mini presentation.
- Lead delivery of the psychological factors associated with sport injury rehabilitation adherence, with a focus on engaging learners through discussion.

Unit 15: Sports Injury and Assessment
• Explore the psychological response to injury, and the psychological factors associated with injury rehabilitation, by inviting 'semi/elite/pro' athletes who have sustained injuries to share their experiences and discuss the psychological effects. • Produce a quiz for learners to consolidate individual learning.
Learning aim C – Investigate aetiology of sports injuries and their associated prevention strategies
• Introduce learning aim C to learners by discussing their experiences of injury, aetiology (cause, or causes, of injury), and the predisposition of certain individuals to injury, and injury prevention models including reference to gait analysis. • Divide the class into two teams – intrinsic and extrinsic. Team members should work together to ensure that the unit content is researched between them. Each team should research associated risk factors (intrinsic or extrinsic, as appropriate), using the internet and textbooks. Each team should devise a table identifying the risk factor, e.g., 'training error', and in a separate column state all the risk factors associated with training errors. You should check the teams' tables to ensure all content has been included and is accurate. The teams then swap tables and proceed, as a team, to discuss preventative measures, which are then documented in an additional column in the table. • Lead a discussion regarding intrinsic and extrinsic risk factors, using visual aids such as digital footage to verify learning. Extensive learner engagement can be achieved through question, answer and discussion based on the team research activity. Throughout, peer review should be encouraged with individual and group by tutor-led question and answer session. • Formally deliver the principles of injury prevention and injury prevention models, using and applying learner's knowledge through question and answer and discussion. Provide scenarios that allow learners, in pairs, to apply the injury prevention model. Learners then present feedback to the group, with peer review and question and answer. • Introduce gait, to set the foundations for practical learner engagement. This should include aspects such as walking gait, running gait and abnormalities, to allow learners to apply the theory to practice. • As a class, learners should review a range of people's gaits. The group should brainstorm findings, such as feet rolling in or out, walking on toes and aspects specific to gait phases etc. From this, learners should create their own checklist of things to analyse. You could get learners to record their own gait, to view specific digital footage, such as on video sharing websites, and analyse these using the checklist. Alternatively, learners could analyse each other's gait. • In small groups, learners should discuss and demonstrate problem-solving skills, to identify possible associated lower limb injuries, and factors that may further affect injury risk. Groups should 'snowball' information to share their findings. • A guest speaker, such as a podiatrist, sports therapist or physiotherapist, could be invited to talk to learners about gait analysis and how to treat or prevent injury. (Learners could also visit these professionals in their practice environment.)
Learning aim D – Explore common treatment and rehabilitation methods
• Introduce learning aim D1 by discussing learners' experiences of dealing with injury, the use of first-aid skills and the need for medical referral.

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Unit 15: Sports Injury and Assessment
• You, or a qualified first aider, should demonstrate common treatment methods, with learners using role play to practise the skills. Discussion about the techniques should encourage learners to apply the skills confidently and effectively. It is recommended that you deliver no more than two skills before getting learners to practise them. • Divide the group into research teams. Each team is to devise and complete a worksheet to identify, when a referral is required, appropriate medical personnel to refer to and how to refer an injured person. • To consolidate learning, and further develop confident and effective application, give learners a practical (role play) scenario or a situation in which they need to apply treatment methods. You should question them during the application. The role play could be videoed, allowing for later analysis and reflection by the learner about what they did correctly and any areas for improvement. • Introduce learning aims D2 and D3 by using digital footage of aspects of rehabilitation, followed by a question and answer session to ascertain learners' prior knowledge. • Formally deliver the stages, principles and progression of rehabilitation, using specific injury examples, real-life examples, visuals aids and digital footage, where possible. • Ask learners, in groups, to reflect on the content of your delivery, and to prepare relevant questions concerning aspects of rehabilitation (ensuring coverage of the unit content) for the forthcoming interview of an industry professional. The learners interview an industry professional, e.g., sports and rehabilitation therapist or a physiotherapist or a sports psychologist. Follow up by leading a discussion to consolidate learning using question and answer. • Deliver methods of rehabilitation in a practical environment and manner. Ensure that learners engage fully and experience all aspects of the session. Discussion should include progression, alternatives, adaptations and any other considerations required, including monitoring. Consolidate learners' understanding by dividing them into small groups, providing scenarios for which they can design mini rehabilitation programmes, or aspects of a programme. Encourage peer learning by asking groups to present these to each other.

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

This unit links to:

- Unit 1: Sport and Exercise Physiology
- Unit 2: Functional Anatomy
- Unit 3: Applied Sport and Exercise Psychology
- Unit 4: Field- and Laboratory-based Fitness Testing
- Unit 6: Coaching for Performance and Fitness
- Unit 7: Biomechanics for Sport and Exercise Science
- Unit 8: Specialised Fitness Training
- Unit 10: Physical Activity for Individual and Group-based Exercise

- Unit 11: Sports Massage
- Unit 13: Nutrition for Sport and Exercise Performance
- Unit 14: Technology in Sport and Exercise Science

Resources

In addition to the resources listed below, publishers are likely to produce Pearson-endorsed textbooks that support this unit of the BTEC Nationals in Sport and Exercise Science. Check the Pearson website (http://qualifications.pearson.com/en/support/published-resources.html) for more information as titles achieve endorsement.

Textbooks

First aid

Gill W, *A Practical Guide to Sports First Aid*, Lotus Publishing, 2004 ISBN 9780954318864

St John Ambulance, *First Aid Manual* (10th Edition), DK, 2014 ISBN 9781409342007

Sports injuries

Adams M et al, *BTEC Level 3 National Sport and Exercise Sciences – Student Book*, Pearson, 2016 ISBN 9781292133959

Bahr R and Maehlum S, *Clinical Guide to Sports Injuries*, Human Kinetics, 2003 ISBN 9780736041171

Brukner P and Khan K, *Clinical Sports Medicine* (Fourth Edition), McGraw-Hill Medical, 2012 ISBN 9780070998131

Gledhill A, *Foundations in Sports Therapy*, Heinemann, 2011 ISBN 9780435046859

Peterson L and Renstrom P, *Sports Injuries: Their Prevention and Treatment* (Third Edition), CRC Press, 2000 ISBN 9781853171192

Stafford-Brown J et al, *BTEC Level 3 National Sport and Exercise Sciences*(Fourth Edition), Hodder Education, 2016 ISBN 9781471878633

Walker B, *The Anatomy of Sports Injuries: Your Illustrated Guide to Prevention, Diagnosis and Treatment* (Second Revised Edition), Lotus Publishing, 2012 ISBN 9781905367382

Rehabilitation

Beachle T and Earle R, *Essentials of Strength Training and Conditioning* (Third Edition), Human Kinetics, 2008 ISBN 9780736058032

Comfort P and Abrahamson E, *Sports Rehabilitation and Injury Prevention,* Wiley-Blackwell, 2010 ISBN 9780470985632

Prentice W, *Rehabilitation Techniques for Sports Medicine and Athletic Training* (Fifth Edition), McGraw-Hill Higher Education, 2010 ISBN 9780071289535

Terminology

Kent M, *Oxford Dictionary of Sports Science and Medicine* (Third Edition), Oxford University Press, 2006 ISBN 9780199210893

Journals

The following journals provide articles relating to varied aspects of the specification content for the sports injuries unit.

British Journal of Sports Medicine (BJSM) Clinical Journal of Sports Medicine

Journal of Physiotherapy & Sports Medicine

Journal of Sport Rehabilitation

Peak Performance (Green Star Media)

Sports Injury Bulletin (Green Star Media)

Websites

http://bjsm.bmj.com – The British Journal of Sports Medicine (BJSM) has open access to some key articles and free podcasts. It is a useful portal for research, debates and news about sports medicine.

www.nhs.uk – Provides recommendations for the treatment and management of sports injuries, including first aid.

www.nsmi.org.uk – Provides information about sports injury, classification, signs and symptoms, mechanisms and injury prevention.

www.patient.co.uk – Patient is an independent health website set up by Patient information Publications. Apart from other health-related information, it contains specific information about sports injuries, such as signs and symptoms, treatment and prevention.

www.physioroom.com – Offers educational content and features related to sports injury and sports medicine, including signs and symptoms, prevention and explaining jargon.

www.redcross.org.uk – The Red Cross is a first-aid organisation offering courses specifically related to sports injuries, including all aspects of first-aid management in the field.

www.sja.org.uk – St John Ambulance is a dedicated first-aid organisation, often present at sporting events. SJA offers courses ranging from basic sports first aid, training for school staff to match day first aid.

www.sportsinjuryclinic.net – Provides extensive information about sports injuries, prevention and rehabilitation.

www.stopsportsinjuries.org – Provides about a wide range of information about sports injuries and includes a virtual sports injury clinic, a symptom checker and advice on rehabilitation exercises and finding a sports injury clinic. There is also a range of interviews with top sports injury professionals about their particular specialist area.

www.topendsports.com – Topend Sports provides a wide range of easily accessible information about sports medicine, fitness and nutrition. It also has links to information about a large range of sports.

Magazines

The following magazines from Centor Publishing provide overarching information and articles regarding sports injury, treatment and prevention.

SPORTEX dynamics

SPORTEX health (online only)

SPORTEX medicine