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CAMBRIDGE NATIONALS IN SPORT SCIENCE

Level 1/2

R042 APPLYING PRINCIPLES OF TRAINING

DELIVERY GUIDE

APRIL 2015

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INTRODUCTION

This Delivery Guide has been developed to provide practitioners with a variety of creative and practical ideas to support the delivery of this qualification. The Guide is a collection of lesson ideas with associated activities, which you may find helpful as you plan your lessons.

OCR has collaborated with current practitioners to ensure that the ideas put forward in this Delivery Guide are practical, realistic and dynamic. The Guide is structured by learning objective so you can see how each activity helps you cover the specification.

We appreciate that practitioners are knowledgeable in relation to what works for them and their learners. Therefore, the resources we have produced should not restrict or impact on practitioners' creativity to deliver excellent learning opportunities.

Whether you are an experienced practitioner or new to the sector, we hope you find something in this guide which will help you to deliver excellent learning opportunities.

If you have any feedback on this Delivery Guide or suggestions for other resources you would like OCR to develop, please email resourcesfeedback@ocr.org.uk.

PLEASE NOTE

The activities suggested in this Delivery Guide **MUST NOT** be used for assessment purposes. (This includes the Consolidation suggested activities).

The timings for the suggested activities in this Delivery Guide **DO NOT** relate to the Guided Learning Hours (GLHs) for each unit.

Assessment guidance can be found within the Unit document available from www.ocr.org.uk/qualifications/cambridge-nationals-sport-science-level-1-2-j802-j812/

The latest version of this Delivery Guide can be downloaded from the OCR website

<http://www.ocr.org.uk/qualifications/cambridge-nationals-sport-science-level-1-2-j802-j812>

OPPORTUNITIES FOR ENGLISH AND MATHS SKILLS DEVELOPMENT

We believe that being able to make good progress in English and maths is essential to learners in both of these contexts and on a range of learning programmes. To help you enable your learners to progress in these subjects, we have signposted opportunities for English and maths skills practice within this resource. These suggestions are for guidance only. They are not designed to replace your own subject knowledge and expertise in deciding what is most appropriate for your learners.

KEY



UNIT R042 – APPLYING PRINCIPLES OF TRAINING

Guided learning hours : 30

PURPOSE OF THE UNIT

In the world of team and individual sport, it is vital that coaches keep their performers in peak condition. They do this by regularly monitoring them through fitness tests and by designing bespoke training programmes to suit the type of sport, performance schedule and the individual themselves. High quality training programmes apply principles of training to the requirements of the individual in their development and implementation.

By completing this unit, learners will develop knowledge and understanding of the principles and methods of training and the application of these in the design of training programmes along with practical skills in fitness testing.

Learning Outcome — The learner will:
LO1 Know the principles of training in a sporting context
LO2 Know how training methods target different fitness components
LO3 Be able to conduct fitness tests
LO4 Be able to develop fitness training programmes

RELATED ACTIVITIES

The Suggested Activities in this delivery Guide listed below have also been related to other Cambridge Nationals in Sport units/Learning Outcomes (LOs). This could help with delivery planning and enable learners to cover multiple parts of units.

This unit (Unit R042)	Title of Suggested Activity	Other units/LOs	
LO1	Everything in moderation	R042 Applying principles of training	LO2 Know how training methods target different fitness components
	Variance	R042 Applying principles of training	LO2 Know how training methods target different fitness components
LO2	Aerobic and anaerobic exercise	R043 The body's response to physical activity	LO3 Be able to assess the short-term effects of physical activity on the musculo-skeletal and cardio-respiratory systems
			LO4 Be able to assess the long-term effects of physical activity on the musculo-skeletal and cardio-respiratory systems
	Aerobic and anaerobic activities	R043 The body's response to physical activity	LO3 Be able to assess the short-term effects of physical activity on the musculo-skeletal and cardio-respiratory systems
			LO4 Be able to assess the long-term effects of physical activity on the musculo-skeletal and cardio-respiratory systems
	Components of fitness	R052 Developing sports skills	LO1 Be able to use skills, techniques and tactics/strategies/compositional ideas as an individual performer in a sporting activity
			LO2 Be able to use skills, techniques and tactics/strategies/compositional ideas as a team performer in sporting activity
	Assessing components of fitness	R052 Developing sports skills	LO3 Be able to officiate in a sporting activity
			LO4 Be able to apply practice methods to support improvement in a sporting activity
	Training methods presentation	R042 Applying principles of training	LO1 Know the principles of training in a sporting context
	Training methods delivery	R042 Applying principles of training	LO1 Know the principles of training in a sporting context

The Suggested Activities in this delivery Guide listed below have also been related to other Cambridge Nationals in Sport units/Learning Outcomes (LOs). This could help with delivery planning and enable learners to cover multiple parts of units.

This unit (Unit R042)	Title of Suggested Activity	Other units/LOs	
LO3	Components of fitness – practical activity	R042 Applying principles of training	LO2 Know how training methods target different fitness components
		R046 Technology in sport	LO1 Know how technology is used in sport
	Conducting fitness tests	R042 Applying principles of training	LO2 Know how training methods target different fitness components
LO4	Setting SMART goals	R042 Applying principles of training	LO1 Know the principles of training in a sporting context
			LO2 Know how training methods target different fitness components
	Planning a fitness training programme	R042 Applying principles of training	LO1 Know the principles of training in a sporting context
			LO2 Know how training methods target different fitness components
			LO3 Be able to conduct fitness tests
		R052 Developing sports skills	LO3 Be able to officiate in a sporting activity
			LO4 Be able to apply practice methods to support improvement in a sporting activity
			LO4 Be able to apply practice methods to support improvement in a sporting activity
	Evaluate a fitness training programme	R052 Developing sports skills	LO3 Be able to officiate in a sporting activity
			LO4 Be able to apply practice methods to support improvement in a sporting activity

KEY TERMS

Explanations of the key terms used within this unit, in the context of this unit

Key term	Explanation and example
Aerobic exercise	Exercise that can range in intensity from high to low (e.g. jogging, swimming) and is carried out over an extended period of time (2 minutes plus) so that the body needs oxygen to produce Adenosine Triphosphate (ATP), the body's primary energy source.
Anaerobic exercise	Short (up to two minutes), intense bursts of exercise (e.g. sprinting, weightlifting) that utilise ATP stored in the muscles for energy and is not dependent on oxygen.
FITTA	An acronym for the principles of training: Frequency Intensity Time Type Adherence
Identify	Recognise or select relevant characteristics, this may be presented in the form of a list accompanied by a brief description.
Normative data	Data that relates to an ideal standard and is based on what is considered to be the norm or 'average' – all the fitness test results have to be interpreted with reference to normative data for the specific test and the specific age group of the participants of the test. For example, the average distance achieved in a vertical jump test for a 16-19 year old male is 40-49 cm.
Protocols	These are a set of rules that explain the correct procedure to be followed in a formal situation.
Range and Wide range	Two examples constitute a range and three or more examples constitute a wide range.
Specific sporting context	Relating an example given to a specific sport, for example, discussing how a particular training method will help to improve agility for basketball rather than agility in general.
Test sequence	The order in which fitness tests are carried out, test sequence can impact test results.
Validity	Fit for purpose, relevant for what it is trying to achieve/demonstrate.

MISCONCEPTIONS

Some common misconceptions and guidance on how they could be overcome

What is the misconception?	How can this be overcome?	Resources which could help
Use of relevant sporting examples	The sporting examples described demonstrate understanding of the principle of training they relate to.	https://www.ocr.org.uk/Images/182635-applying-principles-of-training.pdf
Description of the FITTA principle	Identify each letter of the acronym ensure that a relevant sporting example accompanies the explanation.	https://www.ocr.org.uk/Images/182635-applying-principles-of-training.pdf
Description of aerobic and anaerobic exercise	Oxygen should be referenced in each description.	https://www.ocr.org.uk/Images/182635-applying-principles-of-training.pdf http://www.fitness19.com/aerobic-and-anaerobic-exercise-what-is-the-difference/
Specific training methods for the components of fitness	Every specific training method that is mentioned needs to be fully described e.g. when interval training is mentioned explain what exactly interval training is.	https://www.ocr.org.uk/Images/182635-applying-principles-of-training.pdf http://www.bbc.co.uk/schools/gcsebitesize/pe/exercise/1_exercise_principles_rev2.shtml
How training methods target fitness components in combination	By doing both flexibility and agility training it will improve the performance of athletes in gymnastics.	https://www.ocr.org.uk/Images/182635-applying-principles-of-training.pdf
Normative data	The normative data relevant to the fitness test being done and age of the participants must be included and referenced.	https://www.ocr.org.uk/Images/182635-applying-principles-of-training.pdf http://www.brianmac.co.uk/wallsquat.htm http://www.brianmac.co.uk/sitreach.htm http://www.brianmac.co.uk/sgtjump.htm http://www.brianmac.co.uk/sitreach.htm http://www.brianmac.co.uk/illinois.htm http://www.brianmac.co.uk/storktst.htm
Interpret the test results making reference to normative data	The results that are recorded are interpreted against the appropriate normative data.	https://www.ocr.org.uk/Images/182635-applying-principles-of-training.pdf http://www.teachpe.com/fitness/fitness_tests.php
The tests are reliable and valid	After all of the tests have been conducted there is reference to reliability and validity.	https://www.ocr.org.uk/Images/182635-applying-principles-of-training.pdf

Some common misconceptions and guidance on how they could be overcome		
What is the misconception?	How can this be overcome?	Resources which could help
Maximal; submaximal and test sequence	Which tests are maximal and sub maximal and why have the tests have been conducted in the sequence chosen.	https://www.ocr.org.uk/Images/182635-applying-principles-of-training.pdf http://www.topendsports.com/testing/guide-conduct.htm#
Fitness training programme client information	The details about the subject the programme is being designed for are part of the introduction.	https://www.ocr.org.uk/Images/182635-applying-principles-of-training.pdf
The fitness programme aims do not relate to the data collected in LO3	The appropriate data from LO3 is referred to in the introduction to the fitness programme.	https://www.ocr.org.uk/Images/182635-applying-principles-of-training.pdf http://www.brianmac.co.uk/genfitness.htm
Use of the principles of training	Indicate within the training programme where the principles of training have been included.	https://www.ocr.org.uk/Images/182635-applying-principles-of-training.pdf
The length of the fitness programme	It is recommended that the training programme is of six weeks duration.	https://www.ocr.org.uk/Images/182635-applying-principles-of-training.pdf
Determining the amount of information in the fitness programme	There needs to be sufficient detail in the programme which demonstrates the principles of training. For example, if circuit training is included as part of the programme details of the stations in the circuit need to be included.	https://www.ocr.org.uk/Images/182635-applying-principles-of-training.pdf
Carry out the fitness programme	Ensure there is sufficient time for the programme to be carried out.	https://www.ocr.org.uk/Images/182635-applying-principles-of-training.pdf
Evaluation does not focus on the training programme design	Evaluation looks at the design of the programme and includes ideas for improvement which are specific and justified.	https://www.ocr.org.uk/Images/182635-applying-principles-of-training.pdf

SUGGESTED ACTIVITIES

LO1 - KNOW THE PRINCIPLES OF TRAINING IN A SPORTING CONTEXT

Learning Outcome — The learner will:

LO1 Know the principles of training in a sporting context

Suggested content	Suggested activities	Suggested timings	Links to other units
1 Principles of training 	Teachers could give learners the opportunity to define the main words associated with principles of training (progression, specificity, reversibility, moderation, and variance). This can be done in various ways depending upon the learners' previous knowledge and experience. Teachers could ask learners to work individually, in pairs or small groups. Learners could be asked to define with no supporting resources, could be given the task of finding definitions online or from other resources or could be given key words and definitions and asked to match them up correctly. Lesson Element Principles of training can be used to record the key terminology.	30 minutes	
2 FITTA 	Learners should understand the acronym FITTA (Frequency Intensity Time Type Adherence) as part of the principle of progression. Again learners can be asked to define each of the five words that make up this acronym (frequency, intensity, time, type, and adherence). Once learners know what each word is/means the teacher could give learners a 'case study' for example: <ul style="list-style-type: none"> • a 36 year old fun runner who wants to do a 10K run • a 28 year old who hasn't done any sport since leaving school but wants to join her local netball team • a 61 year old who plays bowls but wants to join the tennis club For each case study given the learners could suggest ways that, using the elements of FITTA, the person could get from their starting point to their end goal.	30 minutes	
3 Skill based specificity 	Teachers could give learners a specific sport or activity and ask them to list the skills that a performer would need in order to participate effectively in that particular sport/activity. Learners could then suggest drills that could be used to help performers train these skills. Learners could create a short session plan involving a skill specific warm up and one or two skills drills and if appropriate lead the rest of the group through their session. Lesson Element Principles of training can be used to support this activity.	90 minutes	

Suggested content	Suggested activities	Suggested timings	Links to other units
4 Fitness based specificity 	<p>Teachers could give learners a sport or activity and ask them to list the main types of movement that are used (running, throwing, jumping, balancing etc), the muscles groups that are responsible for the movements and the type of movement it is (fast and explosive, slow and steady, stop-start etc) Learners could suggest activities that will train these same muscle groups and necessitate a similar type of movement. Again learners could plan a short session which incorporates a warm up and activity that is relevant to the sport they were focussed on and if appropriate lead the rest of the group through their session. Lesson element Principles of training can support learners in this task.</p>	90 minutes	
5 Everything in moderation 	<p>Learners can mind map the different aspects that might affect the type of training that a person undertakes. Learners can feedback their thoughts to create a whole group list. Learners can then suggest why and in what way each of the aspects highlighted might affect the type of training carried out and the steps a coach or fitness instructor might take to ensure a fitness session is safe and appropriate for all participants. Learners can record their thoughts on Lesson Element Principles of training.</p>	30 minutes	R042 LO2
6 Variance 	<p>Set the scene with learners by telling them that the new owners of a professional sports team are concerned that their players are bored during training and that they need a new challenge. In small groups, learners must devise a 'new' type of fitness training to 'sell' to their given sports team (teachers can allocate to each group a specific sport/sports team, making sure a range of different types of sport are included). The fitness training needs to be relevant and appropriate for the performers and their sport, but it should be something different and innovative in order to inject a bit of excitement and variety back into training. Learners could research online to find innovative training approaches – the link below might be helpful: http://www.shape.com/fitness/workouts/15-next-big-fitness-trends/</p> <p>Learners can pitch their idea to the rest of the group and if appropriate they could lead their peers through their activity. The template at Task 4 on Lesson Element Training methods and fitness components can be used by learners to help them with their planning.</p>	90 minutes	R042 LO2

LO2 - KNOW HOW TRAINING METHODS TARGET DIFFERENT FITNESS COMPONENTS

Learning Outcome — The learner will:

LO2 Know how training methods target different fitness components

Suggested content	Suggested activities	Suggested timings	Links to other units
1 Aerobic and anaerobic exercise 	Teachers could ask learners to define aerobic and anaerobic exercise and to describe the differences between the two energy systems. Learners could fill in the missing words to complete the explanation on Lesson Element Training methods and fitness components.	15 minutes	R043 LO3&4
2 Aerobic and anaerobic activities 	The teacher could set up a practical circuit for learners to complete. Stations should include a range of both aerobic and anaerobic activities. At the end of the session learners could answer the questions on task 2, Lesson Element Training methods and fitness components.	60 minutes	R043 LO3&4
3 Components of fitness 	Using Task 3 on Lesson Element Training methods and fitness components, learners could match the definition to the correct fitness component. Learners could then suggest three different sports/specific elements from sports that require high levels of each of the components of fitness listed. The website below gives good examples of the different fitness components http://www.bringithomepersonaltraining.com/components-of-physical-fitness/	30 minutes	R052 LO1&2
4 Assessing components of fitness	Learners could watch video clips of different sports and physical activities and list the different components of fitness that they observed 'in action'. This website has a 'components of fitness quiz' which asks learners to watch the clips and decide which fitness component is being shown: https://www.youtube.com/watch?v=qH3Gx4L5YSg	30 minutes	R052 LO3&4

Suggested content	Suggested activities	Suggested timings	Links to other units
5 Training methods presentation 	<p>Working in pairs or small groups, learners could be assigned a specific training method. This could be a type of training (eg cardiovascular, resistance, power etc) or a specific training technique (eg interval, fartlek, free weights, plyometrics etc) depending on how many learners are in the group and the level of detail the teacher expects learners to go in to. Learners must research their given training method/technique and can present their findings to the rest of their peers.</p> <p>Learners could find out aspects such as:</p> <ul style="list-style-type: none"> • fitness component/s that this training method might be appropriate to improve • sport/s that might use this training method as part of a training programme • the types of activities that might be done as part of this training method • the equipment and environment that might be appropriate for their allocated training method • they could give practical demonstrations of their allocated training method and/or lead the group through some associated activities • they could explain the pros and cons of their training method. 	90 minutes	R042 LO1
6 Training methods delivery	<p>As an extension to the activity above, learners could lead their peers through some activities/a session based on the training methods or techniques they researched. This would enable all learners to experience the different training methods in a practical setting. Learners could plan their session using the template on Lesson Element Training methods and fitness components.</p>	Various	R042 LO1

LO3 - BE ABLE TO CONDUCT FITNESS TESTS

Learning Outcome — The learner will:

LO3 Be able to conduct fitness tests

Suggested content	Suggested Activities	Suggested timings	Links to other units
1 Fitness testing guidelines 	<p>Before conducting any sort of fitness testing there are things that should be considered. Some of these things will maximise safety, some will ensure validity whilst others will consider the needs of participants.</p> <p>Learners could mind map all of the things that should be considered before carrying out fitness testing. Once a list has been produced learners can describe why each of the factors identified will be relevant and how to ensure each element is included and considered before and during fitness testing. This website gives a good overview of the issues to consider http://www.topendsports.com/testing/guide-conduct.htm#</p> <p>Learners could create their own 'fitness testing guidance sheet' or similar.</p>	60 minutes	
2 Components of fitness – practical activity 	<p>Learners could be given the opportunity to take part in activities which test the different fitness components. Teachers could set up various fitness tests such as sit and reach, agility run, vertical jump, ruler drop and so on. Learners could have a go at each activity and record their results. This website lists recognised tests for each fitness component along with a description of how to carry out the test and results tables http://www.brianmac.co.uk/conditon.htm</p> <p>Following this practical activity, learners could complete the table on Lesson Element Fitness testing and training programmes to describe each test.</p>	2 hours	R042 LO2 R046 LO1
3 Validity and reliability 	<p>For each of the fitness tests outlined in activity above, learners could think about any potential concerns regarding the validity and reliability of each test. On the table in Lesson Element Fitness testing and training programmes learners can suggest ways in which the validity and reliability of the test might be compromised and what steps can be taken to ensure each test is as valid and reliable as possible.</p>	30 minutes	
4 Maximal and sub maximal 	<p>Learners can define the terms 'maximal' and 'sub-maximal' with reference to fitness testing. Learners can record their definitions on Lesson Element Fitness testing and training programmes. Learners can then suggest potential pros and cons for both types of fitness test and can describe examples of each type of fitness test.</p>	30 minutes	

Suggested content	Suggested Activities	Suggested timings	Links to other units
5 Conducting fitness tests	<p>Learners could conduct their own fitness tests with their peers or other people. The format of this will depend on the number of learners, amongst other things. Learners could take responsibility for one fitness test each (or per pair) and participants could rotate around a circuit of the different tests, learners could select a number of different fitness tests and lead a small group of participants through these, learners could conduct selected fitness tests as part of a wider fitness training programme – using tests to measure baseline fitness at the start and to monitor progress at the end of a fitness programme, or some other format might be used. If fitness testing with children then the following website may be useful http://www.topendsports.com/testing/children.htm</p> <p>Lots of different fitness tests are listed on this website http://www.brianmac.co.uk/eval.htm</p>	Various	R042 LO2
6 Interpreting the results of fitness tests	<p>Learners could analyse and interpret the results of their fitness tests and present their findings in a variety of ways. Learners could compare results within the group, within a wider group or against published 'norms' like those that can be found on these websites http://www.topendsports.com/testing/norms/ http://www.ifafitness.com/book/fittest.htm</p> <p>Learners could create graphs and charts to display their results, learners could present the results to their peers and/or the group who were tested. Learners could make suggestions, based on their interpretation of the results, as to how specific fitness components could be improved.</p>	Various	



LO4 - BE ABLE TO DEVELOP FITNESS TRAINING PROGRAMMES

Learning Outcome — The learner will:

LO4 Be able to develop fitness training programmes

Suggested content	Suggested Activities	Suggested timings	Links to other units
1 What information is needed to plan a fitness programme? 	Learners could create a questionnaire in order to find out the information they will need to develop an effective fitness programme. Learners can mind map the information they will need to get from the participant. Once a comprehensive list is collated, learners can create a questionnaire or interview checklist to ask participants. On Lesson Element Fitness testing and training programmes learners can record their questions and the reasons that piece of information is important.	45 minutes	
2 Asking the right questions	Once learners have created a questionnaire or interview checklist they can go and ask their questions, in order to inform their planning. Learners may be creating a fitness programme for themselves, one of their peers or someone else. Obviously if they are creating a personal training programme, learners only need ask the questions of themselves. If the training programme is for someone else then learners can complete a face to face interview or the questionnaire could be completed remotely.	Various	
3 Setting SMART goals 	Learners can use the information gained from asking their questions to create goals which are Specific, Measureable, Achievable, Realistic and Time measured. Learners can use Lesson Element Fitness testing and training programmes to record their SMART goals.	45 minutes	R042 LO1&2
4 Planning a fitness training programme 	Now that learners have all of the information they need, and have set SMART goals, they can plan their fitness training programme. Learners could devise their own template or could use one the teacher provides. The following websites have free printable fitness training templates that teachers may want to use: http://www.vertex42.com/ExcelTemplates/workout-log.html http://office.microsoft.com/en-gb/templates/results.aspx?qu=fitness+training&ex=1&origin=TC102930055#ai:TC010341055	60 minutes	R042 LO1, 2&3 R052 LO3&4

Suggested content	Suggested Activities	Suggested timings	Links to other units
5 Evaluate a fitness training programme 	Learners could evaluate the success of their planned fitness training programme. Learners could revisit their SMART goals and review them by talking with the participant(s), analysing the facts and figures to see what practical progress has been made, repeating relevant fitness tests to check progress, looking at other measures such as weight, body fat etc if relevant and appropriate. Learners could record their evaluation and use it to create new/amend existing SMART goals for continued progression.	60 minutes	R052 LO3&4

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