

# Unit 29: Use of Firearms in the Environmental and Land-based Sector

<b>Unit code:</b>	<b>Y/600/9199</b>
<b>QCF Level 3:</b>	<b>BTEC National</b>
<b>Credit value:</b>	<b>10</b>
<b>Guided learning hours:</b>	<b>60</b>

## ● Aim and purpose

This unit aims to introduce learners to the skills and knowledge associated with the use of firearms and how these can be applied in practice to the land-based sector. It is designed for learners in centre-based settings looking to progress into the sector or onto further/higher education.

## ● Introduction

Those employed in game and wildlife management and in recreational target shooting must be proficient with a range of firearms, know which firearms and ammunition are appropriate and apply safe practice in firearms handling, both on shooting ranges and in the field.

Firearms are an essential tool in the land-based industries. This unit covers the knowledge and skills required to select and use firearms safely for target shooting and humane shooting of live targets. The related legal framework will be incorporated throughout the unit.

The use of inanimate targets is important for practice and skill development before shooting live targets, ensuring that culling is humane and efficient. Recreational target shooting is also a rapidly expanding sport and can offer diversification opportunities for landowners. Similarly, game and rough shooting opportunities are increasingly in demand and have become important sources of income. Culling deer is essential for the maintenance of healthy deer populations that are in balance with their environment and shooting is the only widely used legal method of culling.

Learners will gain knowledge and understanding of the safe and appropriate use of firearms in the land-based sector and will have the opportunity to develop their practical skills in firearm use. The use of safe and legal practices is emphasised throughout delivery of this unit.

## ● Learning outcomes

**On completion of this unit a learner should:**

- 1 Understand the function of firearms and ammunition
- 2 Understand the ballistics of projectiles in the safe, efficient and humane use of firearms
- 3 Know how to use firearms safely
- 4 Be able to safely and efficiently use firearms.

# Unit content

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## 1 Understand the function of firearms and ammunition

*Firearms and component parts:* types of firearm/ammunition and typical use (shotguns, rifles, target shooting, live target shooting); firearm and ammunition component parts (stock, action, barrels, trigger and safety catch, magazine, fitting/sights, shot/bullet, powder, primer, case, wadding); nomenclature; function; health and safety; firearm safety issues (barrel damage, blockage, damaged parts, ammunition, misfires); risk assessment; current legislation and codes of practice

## 2 Understand the ballistics of projectiles in the safe, efficient and humane use of firearms

*Internal ballistics:* ignition; pressure development; danger of obstruction; projectile behaviour; effect of rifle damage; rifle bedding; rifle barrel crown damage; barrel blockage; obturation; timing of events; misfire

*External ballistics:* velocity and energy at muzzle and at distance; trajectory/spread/pattern; rifle zeroing and sights; maximum and effective range; theory of lead and Clay Pigeon Shooting Association (CPSA) 'Method'

*Terminal ballistics:* penetration; expansion; carcass damage; nervous and hydraulic shock, primary and secondary damage; clay target breakage; safe rifle range design

## 3 Know how to use firearms safely

*Awareness of shooting environment:* clay pigeon sites, rifle ranges and open countryside; safe and unsafe areas; safety protocols; range estimation, safe background

*Safe handling:* firearm storage; firearm maintenance and cleaning; transport; negotiating obstacles; safety catch; load/unload; muzzle awareness; misfire; safe shooting; shooting alone and in company; safe and legal storage; use of personal protective equipment

*Legislation:* restrictions on the possession and use of firearms; current relevant legislation eg Firearms Act 1968; Firearms Amendment Act 1997; game licences; codes of practice eg British Association for Shooting and Conservation (BASC) Code of Good Shooting Practice, National Rifle Association (NRA) Protection of Children and Vulnerable Adults in Target Shooting

## 4 Be able to safely and efficiently use firearms

*Shotgun:* maintenance of safe practice throughout; selection of correct ammunition; variety of targets broken, crossing, overhead, going away, 'rabbit'; health and safety; safety protocols; risk assessment

*Rifle:* maintenance of safe practice throughout; selection of correct ammunition; group size; accuracy; target analysis; zeroing adjustment; variety of target shot, zero, rabbit/fox/deer

## Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
<b>P1</b> examine the functions of firearms and ammunition for covering shotguns and rifles	<b>M1</b> identify and explain the functions of component parts for given firearms and ammunition	<b>D1</b> justify the selection of firearms for a given purpose, and explain the importance of their safe use, handling and maintenance
<b>P2</b> explain the ballistics of selected firearms and the safety issues associated with their use	<b>M2</b> compare the ballistics of selected firearms	
<b>P3</b> explain the terminal ballistics of selected firearms in relation to their humane use on target species		
<b>P4</b> explain how to handle and store selected firearms safely	<b>M3</b> explain the correct cleaning, maintenance, transport and storage of selected firearms and associated ammunition	
<b>P5</b> explain legal requirements and restrictions on the use and possession of firearms		
<b>P6</b> handle firearms safely	<b>M4</b> shoot firearms at selected artificial targets safely to a high standard of accuracy and produce relevant risk assessments.	<b>D2</b> shoot firearms at selected targets safely to achieve a high standard of accuracy, evaluate the shots and make recommendations for improvement.
<b>P7</b> shoot firearms at selected artificial targets safely to a given standard. [SM, EP]		

**PLTS:** This summary references where applicable in the pass criteria, in the square brackets, the elements of the personal, learning and thinking skills. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

# Essential guidance for tutors

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## Delivery

Delivery of this unit will involve practical assessments, written assessment, visits to ranges and may link to work experience placements.

Wherever possible, practical methods should be used in both learning and assessment. Learners must be assessed using at least one form of shotgun and one form of rifle. The rifle should not be an air rifle, although these are useful for training purposes. One-to-one supervision is required, except for rifle shooting on formal ranges where learners are judged to be proficient in safe handling.

Whichever delivery methods are used, it is essential that tutors stress the importance of safe practice, animal welfare and the need to use firearms within the legal framework.

Health and safety issues relating to firearms must be stressed and reinforced regularly, and risk assessments must be undertaken before any practical activities.

Learning outcome 1 covers the identification and function of firearms and ammunition, and the restrictions involved. This is likely to be delivered through classroom-based activities, discussions, visits to clay sites and ranges, supervised practicals and independent research. Learners must understand the safety considerations, legal and moral obligations and restrictions that come with the handling and use of firearms. Every opportunity should be used to help learners make connections between the learning outcomes, in order to gain a good understanding of the subject area.

Learning outcome 2 covers the ballistics of projectiles. This is likely to be delivered through classroom-based activities, discussions, visits to clay sites and ranges, supervised practicals and independent research. The legislative framework surrounding the use of firearms should be referred to where appropriate.

Learning outcomes 3 and 4 deal with the safe handling and use of firearms. This is likely to be delivered through supervised practicals as well as classroom-based activity, discussions, visits to clay sites and ranges, and independent research. Health and safety issues must be addressed before learners handle firearms. Adequate PPE for ears and eyes must be provided and used following the production of suitable risk assessments.

Visiting expert speakers could add to the relevance of the subject for learners. For example, representatives from the Clay Pigeon Shooting Association (CPSA), National Small-Bore Rifle Association (NSRA) or National Rifle Association (NRA) or a practising wildlife manager could talk about their work, the situations they face and the methods they use.

## Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan gives **an indication of the volume of learning it would take the average learner** to achieve the learning outcomes. It is **indicative and is one way of achieving the credit value**.

Learning time should address all learning (including assessment) relevant to the learning outcomes, regardless of where, when and how the learning has taken place.

Topic and suggested assignments/activities and/assessment
Introduction and overview of the unit.
<b>Assignment 1: Components of Firearms and their Functions</b> (P1, M1).
Tutor introduces the assignment brief.
Theory sessions: shotguns and rifles, component parts and their functions, components of ammunition.
Practical sessions identifying component parts of shotguns and rifles.
Learner research and assessment completion.
<b>Assignment 2: Ballistics</b> (P2, P3, M2)
Tutor introduces the assignment brief.
Theory sessions: ballistics, internal, external and terminal.
Classroom activities: reviewing the ballistics of given firearms and recommending for specific uses.
Learner research and assessment completion.
<b>Assignment 3: Firearms Safety and Selection</b> (P4, P5, M3, D1)
Tutor introduces the assignment brief.
Theory sessions: firearms legislation restrictions on possession and use, storage, transportation, maintenance and cleaning.
Practical sessions: handling, maintenance and cleaning of firearms.
Demonstrate how to transport, handle and clean selected firearms.
Classroom session: selecting firearms for specific purposes.
Learner research and assessment completion.
<b>Assignment 4: Firearms Use</b> (P6, P7, M4, D2)
Tutor introduces the assignment brief.
Practical sessions: shotgun and rifle shooting.
Shoot shotguns and rifles at artificial targets safely and improve own performance.
Practical assessments and observation.
Unit review.

## Assessment

For P1, learners must examine the functions of given firearms and ammunition. Tutors should identify the firearms and ammunition or agree them through discussion with learners. As a minimum, learners need to provide evidence covering three different firearms. Evidence for this could be provided by using demo firearms in a safe environment and/or pictorial assessment with notes, or a pictorial presentation with notes. A logbook style of assessment could also be considered.

P2 requires learners to explain the ballistics of selected firearms and the safety issues associated with their use. Tutors should identify the firearms or agree them through discussion with learners. Learners should appreciate the consequences of firing, in particular the basic theory of obturation and pressure build-up. The effect of rifle bedding, rifle barrel crown damage, barrel blockage and misfire should be explored. Evidence could take the form of a written article, pictorial presentation with notes or a project. A logbook style of assessment could also be considered.

P3 requires learners to explain the terminal ballistics of selected firearms in relation to their humane use on target species. Tutors may identify the firearms and target species or agree them through discussion with learners. Evidence may be linked to P2 and could be presented in the same format.

For P4, learners are required to explain how to handle and store selected firearms safely. At least one rifle and one shotgun should be included. Evidence may be a written leaflet or guidance notes, or verbal presentation.

For P5, learners need to explain the legal requirements and restrictions on the use and possession of firearms. Learners should be able to demonstrate a working knowledge of current relevant legislation and how it affects firearm possession and use. Evidence may be linked to P4 and could be presented in the same format.

P6 requires learners to demonstrate safe handling of selected firearms. Tutors should identify the firearms or agree them through discussion with learners. As a minimum, learners should provide evidence covering three different firearms. Particular reference should be made to awareness of the loaded and unloaded condition of firearms, muzzle awareness and use of the safety catch. Assessment is likely to be practical, making use of observation records and/or witness statements. Assessment could be linked to P7. Assessors should complete appropriate observation records to confirm learner achievement.

P7 requires learners to safely shoot firearms at selected artificial targets to a given standard. Tutors should identify the targets and standards. Supervision must be on a one-to-one basis and safety protocols should be reinforced at all times. Learners must demonstrate safe use of firearms at all times to meet P7. Standards could be 40 per cent of a simple clay target hit, three shots within the 'five' ring on an NSRA 25 m target (small-bore, prone) or three shots in a 'four' circle at 100 m (full-bore, prone). Learners must be assessed using at least one form of shotgun and one form of rifle. The rifle should not be an air rifle, although these are useful for training purposes. One-to-one supervision is required, except for rifle shooting on formal ranges where learners are judged to be proficient in safe handling. This criterion could be assessed directly by the tutor during practical activities. If this format is used then suitable evidence from guided activities would be observation records completed by the tutor and accompanied by appropriate work logs or other relevant notes. If assessed during a placement, witness statements should be provided by a suitable representative and verified by the tutor.

For M1, learners need to identify and explain the functions of component parts for given firearms and ammunition. Tutors should identify the firearms and ammunition or agree them through discussion with learners. As a minimum, learners should provide evidence covering three different firearms. Evidence could be an extension of P1 and presented in the same format.

M2 requires learners to compare the ballistics of at least two selected firearms. The firearms may be selected by the tutor or agreed through discussion with learners, but should be two where aspects of the ballistics are significantly different. Evidence for this could be an extension of P2 and P3 and take the same form.

M3 requires learners to explain the correct cleaning, maintenance, transport and storage of selected firearms and associated ammunition. Learners must show consistent knowledge of safe protocols for handling firearms. Evidence may be linked to P4 and P5 and presented in the same format.

For M4, learners need to shoot firearms at selected artificial targets to a high standard of accuracy and produce written risk assessments. Tutors should identify the targets and standards. Supervision must be on a one-to-one basis and safety protocols should be reinforced at all times. Learners must demonstrate safe use of firearms at all times to meet M4. Evidence could be in the form of practical assessments of learners undertaking shooting activities, supported by appropriate assessor observation records to confirm learners achievements.

The standard given could be 50 per cent of a simple clay target hit or three shots within the 'seven' ring on an NSRA 25 m target (small-bore, prone) or a pass at the DSCI shooting test (full-bore). Assessment could be in a similar format to P4, together with written risk assessments.

For D1, learners must justify the selection of firearms for a specific purpose, and explain the importance of safe use, handling and maintenance. The purpose for the firearms should be provided by the tutor, with learners asked to select an appropriate firearm and justify their selection. Evidence may be a written or verbal report or project and may be an extension of M1, M2 and M3.

For D2, learners must safely shoot firearms at selected targets to achieve a given standard of accuracy,

evaluate the shots and make recommendations for improvement. Tutors should identify the targets and standards. Learners must shoot at a variety of targets, for example crossing, overhead, going away, 'rabbit' clay pigeons and zero, rabbit/fox/deer rifle targets. Rifle targets representing animals must be as realistic as possible and have a defined kill zone which is not visible from the firing point. Accuracy standards could be 50 per cent of all of a variety of clay targets hit or three shots within the 'nine' ring on an NSRA 25 m target (small bore, prone), or more than two passes (or pass within the 'seven' ring) at the DSCI shooting test (full bore). Where animal targets are used, all three of a three-shot group should be in the kill zone. Assessment could be in the same format as for M4, with learners showing they can evaluate their shots and recommend improvements.

### Programme of suggested assignments

The following table shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, M1	Components of Firearms and their Functions	You have been asked to give some basic firearms instruction to a group hoping to get involved in recreational shooting.  Demonstrate and explain the functions of the component parts of two different firearms and ammunition.	Demonstration/ Presentation.  Observation records
P2, P3, M2,	Ballistics	You have been asked to write a technical article for a shooting publication explaining ballistics. Explain and compare the ballistics of selected firearms, including the relationship between terminal ballistics and the humane use of firearms.	Written article.
P4, P5, M3, D1	Firearms Safety and Selection	A local gun club has asked you to create some guidance notes for new members. Include explanations of how to handle, clean, maintain, transport and store selected firearms, and why this is important. Your guidance notes should also contain an explanation of the legal requirements and restrictions of firearms possession and use. Explain and justify the selection of firearms for a given purpose as a way of illustrating the different uses of firearms.	Guidance notes.
P6, P7, M4, D2	Firearms Use	You are training as a wildlife officer, and part of your job role is likely to include shooting. Demonstrate that you can handle firearms safely, and that you can shoot shotguns and rifles at artificial targets safely. Include risk assessments, evaluate your shots and recommend how you may improve your shooting performance.	Practical observation and assessment.  Observation records.

## Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC land-based sector suite. This unit has particular links with:

Level 2	Level 3
Introduction to Game Management	Element Ga38.1 Prepare for the shotgun training Element Ga38.2 Carry out the shotgun training Element CU47.1 Determine the need for vertebrate pests and predator control Element CU47.2 Shoot vertebrate pests and predators
	Undertaking Vertebrate Pest and Predator Control
	Understanding Principles of Game Management
	Understanding Ecology of Game Species
	Stalking and Shooting Deer

### Essential resources

Centres will need access to a clay pigeon ground and a rifle range. The minimum requirement for a rifle range would be a 25 m (yard) small-bore range. The majority of learners will not start this unit as owners of firearms, so it might be necessary to obtain formal club status and affiliation to governing bodies such as the CPSA, NSRA or NRA, Section 11 Clay pigeon site exemption or rifle range licences and relevant shotgun or firearms certificates.

A selection of firearms and related demonstration items are essential: at least two operable shotguns (consider one short stocked and/or 20 gauge semi-auto for learners of smaller stature); demo firearms (range of O/U, side by side, semi-auto, pump, bolt action, sound moderators, guns in poor condition, burst/damaged barrels); secure storage facilities for firearms/ammunition. PPE equipment is essential, especially for ears and eyes.

Relevant targetry and waste disposal facilities will also be needed.

### Employer engagement and vocational contexts

This unit focuses on the practical aspects of firearm use and will give learners an underpinning knowledge of firearms. Centres are encouraged to create and develop links with local sporting estates. This could be via guest lectures, practical workshops or visits to see gamekeepers actively involved in the use of a range of firearms.



## Indicative reading for learners

### Textbooks

Backhouse F, Eliot P, Knowles R, Little C and McKelvie C – *The Complete Book Of Shooting* (Octopus, 1988)  
ISBN 0706431871

BASC – *The Handbook of Shooting: The Sporting Shotgun, Fifth Edition* (Swan Hill Press, 2003)  
ISBN 1904057209

Bidwell J and Scott R – *Move, Mount, Shoot: Champion's Guide to Sporting Clays* (The Crowood Press, 1990)  
ISBN 1852233001

Brook M – *The Gameshooters Pocket Guide* (Trafford Publishing, 2006) ISBN 1412048648

Bucknell R – *Foxing with Lamp and Rifle* (Foxearth Publishing, 2001) ISBN 095402060X

Coles C – *Shooting and Stalking: A Basic Guide* (Hutchinson, 1988) ISBN 0091735734

Davis K – *The Better Shot: Step by Step Shotgun Technique with Holland and Holland* (Quiller Press, 2001)  
ISBN 1870948645

Downing G – *Shooting for Beginners: An Introduction to the Sport, Second Edition* (Swan Hill Press, 2004)  
ISBN 1904057314

George M – *The Shotgun Handbook* (The Crowood Press Ltd, 1998) ISBN 1861261578

Marshall-Ball R – *The Encyclopaedia of Sporting Shooting* (Anova Books, 1992) ISBN 0713465476

Marshall-Ball R – *The Sporting Rifle: A User's Handbook, Fourth Edition* (Swan Hill Press, 2002)  
ISBN 1840371161

McCall I – *Your Shoot: Gamekeeping and Management, Second Edition* (A&C Black, 1990)  
ISBN 0713632062

Nahlik A – *Management of Deer and Their Habitat: Principles and Methods* (Coch-y-Bonddu Books, 1992)  
ISBN 0907519016

Parkes C and Thornley J – *Fair Game: The Law of Country Sports and the Protection of Wildlife* (Pelham Books, 1989) ISBN 0720719151

Yardley M – *Positive Shooting* (The Crowood Press, 2001) ISBN 1861264720

### Websites

<a href="http://www.basc.org.uk">www.basc.org.uk</a>	British Association for Shooting and Conservation
<a href="http://www.bds.org.uk">www.bds.org.uk</a>	The British Deer Society
<a href="http://www.cpsa.co.uk">www.cpsa.co.uk</a>	Clay Pigeon Shooting Association
<a href="http://www.defra.gov.uk">www.defra.gov.uk</a>	Department for Environment, Food and Rural Affairs
<a href="http://www.nra.org.uk">www.nra.org.uk</a>	National Rifle Association
<a href="http://www.nsra.co.uk">www.nsra.co.uk</a>	National Small-bore Rifle Association

## Delivery of personal, learning and thinking skills (PLTS)

The following table identifies the PLTS opportunities that have been included within the assessment criteria of this unit:

Skill	When learners are ...
Self-managers	improving own shooting performance
Effective participators	assessing the shooting performance of peers.

Although PLTS opportunities are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are ...
Independent enquirers	researching the ballistics of selected firearms and ammunition combinations.

## ● Functional Skills – Level 2

<b>Mathematics</b>	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	zeroing a rifle
Identify the situation or problem and the mathematical methods needed to tackle it	
Select and apply a range of skills to find solutions	
Use appropriate checking procedures and evaluate their effectiveness at each stage	
Interpret and communicate solutions to practical problems in familiar and unfamiliar routine contexts and situations	
Draw conclusions and provide mathematical justifications	
<b>English</b>	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	listening to lectures and practical demonstrations and discussing firearm issues
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	producing a written article on ballistics producing guidance notes for a local gun club on firearms safety and selection.