

# IFE Level 3 Diploma in Fire Science and Fire Safety (VRQ)

## Unit 2: Fire Safety

Unit Reference Number: F/505/6006

### Introduction

This unit focuses on the prevention and detection of fire in simple domestic, commercial and industrial premises. It covers buildings and building materials, protection equipment and fire safety principles and practices. Candidates must demonstrate ability to explain and apply fire safety principles in different situations.

### Learning Outcomes

Candidates who achieve this unit should be able to:

- explain and analyse fire resistance in relation to different buildings and building materials
- explain the operation of fire protection equipment and assess its effectiveness in different situations
- explain and apply fire safety principles and practices
- assess risks in different situations and identify appropriate action to improve safety

### Unit Status

This is a mandatory unit for candidates who wish to achieve the Level 3 Diploma in Fire Science and Fire Safety.

### Content

#### 1. Building Construction

Assessment Objective	Knowledge, Understanding and Skills
1.1 Interpret plans	<ul style="list-style-type: none"> <li>• Plans for domestic and industrial buildings</li> <li>• Graphical symbols used for fire protection</li> </ul>
1.2 Explain the way in which building materials are used, comment on their behaviour in fire and assess the implications for fire safety	Building materials to include: <ul style="list-style-type: none"> <li>• Timber</li> <li>• Stone</li> <li>• Brick</li> <li>• Cement</li> <li>• Concrete (reinforced and pre-stressed)</li> <li>• Metals</li> </ul>

	<ul style="list-style-type: none"> <li>• Glass</li> <li>• Building boards and building slabs</li> <li>• Insulating materials</li> <li>• Paint</li> <li>• Plastics</li> <li>• Sandwich panels</li> <li>• Photovoltaic panels</li> </ul>
1.3 Define elements of structure, state their function and assess their impact on fire resistance	<ul style="list-style-type: none"> <li>• Columns</li> <li>• Beams</li> <li>• Walls</li> <li>• Floors</li> <li>• Roofs</li> <li>• Non load bearing walls and partitions</li> <li>• Stairways</li> <li>• Doors</li> <li>• Windows</li> <li>• Roof lights</li> <li>• Ceilings</li> </ul>
1.4 Describe the various types of heating, ventilation and air conditioning systems that are used in buildings and assess the effects they may have on a fire and the fire suppression methods used in these systems	<ul style="list-style-type: none"> <li>• Heating systems</li> <li>• Ventilation</li> <li>• Air conditioning systems</li> <li>• Stairwell pressurisation systems</li> <li>• Ventilation and smoke handling systems</li> </ul>
1.5 Explain the methods of servicing buildings and assess the implications for fire safety	<ul style="list-style-type: none"> <li>• Electricity</li> <li>• Gas</li> <li>• Water</li> <li>• Lifts</li> <li>• Escalators</li> </ul>
1.6 Explain the requirements and principles of elements of buildings and assess their role in fire resistance	<ul style="list-style-type: none"> <li>• Separating walls</li> <li>• Compartment walls and floors</li> <li>• Junctions formed by elements of structure</li> <li>• Protected shafts and protecting structures</li> <li>• Fire resisting doors and other enclosures</li> <li>• Space separation</li> </ul>

## 2. Fire Safety Principles and Fire Protection Equipment

Assessment Objective	Knowledge, Understanding and Skills
2.1 Explain and apply the principles of means of escape in case of fire	Principles of means of escape and effects of: <ul style="list-style-type: none"> <li>• Construction</li> <li>• Time of evacuation</li> <li>• Occupancy</li> <li>• Exits</li> <li>• Travel distance</li> <li>• Management control</li> </ul>
2.2 Describe and assess the arrangements in place for means of escape for individuals in different situations	<ul style="list-style-type: none"> <li>• Pre-planned arrangements for ensuring the safety of people</li> <li>• Principles of evacuation procedures that should be adopted in case of fire</li> <li>• How the behaviour of people in a fire can adversely affect evacuation and means of escape</li> <li>• How the physical needs of different people can affect evacuation e.g. mobility, size, health, age</li> </ul>
2.2 Describe and assess the purpose and implementation of fire precautions in the protection of people, property and the environment	<ul style="list-style-type: none"> <li>• The purpose of fire precautions in the protection of people, property and the environment</li> <li>• Use, siting and contents of fire notices</li> <li>• Use and siting of different types of system including fire extinguishers</li> <li>• Use of passive and active systems including different types of equipment</li> <li>• Basic principles that apply to the installation of: <ul style="list-style-type: none"> <li>○ Emergency lighting systems</li> <li>○ Fire venting systems</li> </ul> </li> </ul>
2.3 Describe and explain the design features, installation, use, maintenance and operations of types of fixed installations, assessing their effectiveness in different contexts	<ul style="list-style-type: none"> <li>• Sprinkler systems</li> <li>• Drencher and water spray projector systems</li> <li>• Rising mains</li> <li>• Hose reels</li> <li>• Foam systems</li> <li>• Gas/vapour systems</li> <li>• Dry powder systems</li> <li>• Fire detection systems – Smoke, Heat and Flame</li> <li>• Electrically operated fire alarm systems – manual and automatic</li> </ul>
2.4 Describe and explain the use, siting and maintenance of portable and fixed extinguishing equipment, assessing their effectiveness in different contexts	<ul style="list-style-type: none"> <li>• Sprinkler systems</li> <li>• Drenchers</li> <li>• Water spray projectors and water mist systems</li> <li>• Rising mains</li> <li>• Foam systems</li> <li>• Gas/vapour systems</li> <li>• Dry powder systems</li> </ul>
2.5 Explain and assess the fire precautions to be applied in different premises	<ul style="list-style-type: none"> <li>• Commercial office premises</li> <li>• Retail premises</li> <li>• Factories and other places of manual work</li> </ul>

	<ul style="list-style-type: none"> <li>• Places of public entertainment, including cinemas, theatres, dance halls and premises used only occasionally for these purposes</li> <li>• Premises where alcoholic liquor is consumed</li> <li>• Hotels and other relevant premises</li> <li>• Heath and other care-related premises</li> </ul>
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### 3. Fire Safety Review and Advice

Assessment Objective	Knowledge, Understanding and Skills
3.1 Identify and assess fire hazards and risks in and around different premises	<ul style="list-style-type: none"> <li>• Define the terms “hazards” and “risks”</li> <li>• How to check for hazards, risks and fire precautions within different areas of the premises in relation to construction, layout and use</li> <li>• How to assess the type and level of risk associated with different hazards within different areas of premises</li> <li>• Identification of people who may be at risk</li> <li>• Identification of risks to property and the environment</li> <li>• Consequences of failing to identify hazards and control risks</li> <li>• Common causes of fire in different occupancies</li> <li>• Identification of suitable options to eliminate, reduce or control risk in simple premises</li> <li>• How to prioritise risks and solutions</li> </ul>
3.2 Review control measures in current and planned situations	<ul style="list-style-type: none"> <li>• How to review effectiveness of current measures</li> <li>• How to provide feedback on effectiveness of current measures</li> <li>• How to evaluate planned changes and their impact and identify solutions</li> </ul>
3.3 Explain the purpose of fire safety training and the testing of fire precautions	<ul style="list-style-type: none"> <li>• Identification of training requirements for people with fire safety responsibility</li> <li>• Importance of testing precautions in place and how to do this</li> </ul>
3.4 Explain and assess methods of improving public fire safety	<ul style="list-style-type: none"> <li>• How to explain risks to members of the public and property owners/managers</li> <li>• How fire incidents can impact on business continuity and stakeholders in simple premises</li> <li>• The role and interests of stakeholders in protection of life, property and the environment from fire</li> <li>• Risks in the community and prioritising safety programmes</li> <li>• Objectives of safety education in the community</li> <li>• Methods to engage diverse community members and stakeholders</li> </ul>