

LESSON ONE

FIREFIGHTER II

Fire Hose, Appliances and Streams

DOMAIN: COGNITIVE

LEVEL OF LEARNING: KNOWLEDGE

MATERIALS

IFSTA Essentials 5th edition or Jones and Bartlett Fundamentals of Fire Fighter Skills 2nd Edition or Delmar Firefighter's Handbook 3rd Edition; overhead projector or laptop computer and multimedia projector; projection screen; Class A pumper.

NFPA 1001 JPR, 2008 edition

6.3.2 Coordinate an interior attack line team's accomplishment of an assignment in a structure fire

Junior Member Statement:

Junior Member training activities should be supervised by qualified instructors to assure that the cognitive and psychomotor skills are completed in a safe and non-evasive manner. While it is critical that instructors be constantly aware of the capabilities of all students both mentally and physically to complete certain tasks safely and successfully, the instructor should take every opportunity to discuss with departmental leaders and students the maturity and job awareness each participant has for the hazards associated with fire and rescue training.

TERMINAL OBJECTIVE

The Firefighter II candidate when given a fire scenario shall correctly select the proper hose and nozzle for a given fire, and describe the advantages and disadvantages of each selection.

ENABLING OBJECTIVES

1. The Firefighter II candidate when given a selection of fog nozzles shall correctly describe and demonstrate their use.
2. The Firefighter II candidate when given a selection of solid stream nozzles shall correctly describe and demonstrate their use.
3. The Firefighter II candidate shall correctly define in writing the rate of flow necessary to control various fire situations.

LESSON ONE

FIREFIGHTER II

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MOTIVATION

The technique of water application is only successful if the amount of water applied is sufficient to cool the fuels that are burning. The amount of water applied to a fire per minute of operation must exceed the B.T.U.s being generated per minute by the fire. Therefore, the flow rate per minute may be more important than the total available water supply. The firefighter should possess a good understanding of nozzle design and flow rates to permit the proper selection of nozzles for a given fire. It often appears that a firefighter may accomplish the impossible by using a small amount of water delivered at a high rate of flow.

PRESENTATION

ENABLING OBJECTIVE #1

The Firefighter II candidate when given a selection of fog nozzles shall correctly describe and demonstrate their use.

1. Illustrate and discuss a fog nozzle pattern.
2. List and discuss the advantages and disadvantages of a fog nozzle.
3. Discuss when a small hose line application is appropriate such as a booster line at 40 GPM or less.
 - a) Small exterior fire, grass fire, light brush fire.
 - b) Chimney fire, with no extension beyond chimney into wall structure.
 - c) Overhaul.
4. Discuss the advantages of small hose line application.

- a) Quick application.
 - b) They are easy to deployment and are mobile.
 - c) They require fewer personnel to initiate attack.
 - d) They can be restored to service more quickly than conventional hose.
5. Discuss the problems associated with using small hose line application for structural fire attack:
 - a) The water applied can give inadequate B.T.U. absorption.
 - b) They provide inadequate protection for firefighters during rollover and flashover conditions.
 6. Describe the design characteristics of a fog nozzle.
 7. Discuss the safety aspects of the wide pattern of a fog nozzle and how it impacts the firefighter.
 8. Discuss and demonstrate the operation of various patterns of a fog nozzle.

Reference:

Delmar Handbook 3rd edition, pages 326-328

J&B Fundamentals 2nd edition, pages 517-518, 618-619

IFSTA Essentials 5th edition, pages 724, 728-731, 744-746, 763-765

APPLICATION

Provide the candidates with a selection of fog nozzles and allow them to describe their design and demonstrate their correct operation.

PRESENTATION

ENABLING OBJECTIVE #2

The Firefighter II candidate when given a selection of solid stream nozzles shall correctly describe and demonstrate their use.

1. Discuss the characteristics of a solid stream nozzle pattern.
2. List the advantages and disadvantages of a solid stream nozzle.

3. Describe the design of a straight stream nozzle.
4. Point out the fact that solid stream nozzles may not provide adequate protection against rollover or flashover during an interior fire attack.
5. Discuss and demonstrate the operation of various straight stream nozzles.

Reference:

Delmar Handbook 3rd edition, pages 326-332

J&B Fundamentals 2nd edition, pages 517, 618-619

IFSTA Essentials 5th edition, page 726

APPLICATION

Provide the candidates with a selection of solid stream nozzles and allow them to describe their design and demonstrate their correct operation.

PRESENTATION

ENABLING OBJECTIVE #3

The Firefighter II candidate shall correctly define in writing the rate of fire flow necessary to control various fire situations.

1. Discuss and define British thermal unit.
2. Discuss the characteristics of water and the process that occurs as it changes from a solid, to a liquid and to a gaseous state.
3. Explain that when water is divided into small particles, as in fog application, it will absorb heat more quickly.
4. Discuss the expansion ratio of water and the impact it can have on fire suppression in confined spaces as well as its effect on occupants that may be in the vicinity.
 - a) Helps cool the fire area.
 - b) Displaces present toxic gases.
 - c) Can aid in fire extinguishment.

5. Provide an illustration outlining a one-room fire situation and discuss how the principles discussed above will impact actual fire control.
6. Discuss the following fire flow formulas and how they can be used to determine the type of nozzle and flow rate needed on a given fire.
 - a) NFA formula. $GPM = (L \times W) / 3$.
 - b) Cubic foot formula from Iowa State University:
 $GPM = \text{Cubic feet} / 100$.
 - c) Modified Cubic foot formula is the same as above, but round building sizes to 10 foot increments.

Reference:

Delmar Handbook 3rd edition, pages 94, 335

IFSTA Essentials 5th edition, pages 87, 89, 717-722, 728

APPLICATION

Divide the class into small groups and provide each with a sketch of a building, containing a simulated fire situation. Allow each group to determine the water flow rate needed to control the fire.

SUMMARY

Retrace the steps in selecting the proper nozzle and hose line for fire attack.

Review the operation of nozzles.

Briefly illustrate each of the fire flow formulas.

LESSON TWO

FIREFIGHTER II

Fire Hose, Appliances and Streams

DOMAIN: PSYCHOMOTOR

LEVEL OF LEARNING: APPLICATION

MATERIALS

NFPA 1410; IFSTA Essentials 5th edition or Jones and Bartlett Fundamentals of Fire Fighter Skills 2nd Edition or Delmar Firefighter's Handbook 3rd Edition; overhead projector or laptop computer and multimedia projector; projection screen; Class A pumper.

NFPA 1001 JPR, 2008 edition

6.3.2 Coordinate an interior attack line team's accomplishment of an assignment in a structure fire

Junior Member Statement:

Junior Member training activities should be supervised by qualified instructors to assure that the cognitive and psychomotor skills are completed in a safe and non-evasive manner. While it is critical that instructors be constantly aware of the capabilities of all students both mentally and physically to complete certain tasks safely and successfully, the instructor should take every opportunity to discuss with departmental leaders and students the maturity and job awareness each participant has for the hazards associated with fire and rescue training.

TERMINAL OBJECTIVE

The Firefighter II candidate when given a selection of adapters, appliances, and hose tools shall correctly identify each item, state its purpose, and describe its use.

ENABLING OBJECTIVES

1. The Firefighter II candidate when given a selection of adapters shall correctly identify in writing each item, state its purpose, and describe its use.
2. The Firefighter II candidate when given a selection of appliances shall correctly identify in writing each item, state its purpose, and describe its use.
3. The Firefighter II candidate when given a selection of hose tools shall correctly identify in writing each item, state its purpose, and describe its use.

LESSON TWO

FIREFIGHTER II

Fire Hose, Appliances and Streams

MOTIVATION

For a firefighter to operate effectively during fire ground operations, it is imperative that the firefighter understands the proper hose and nozzle selection, and the many appliances and adapters that can be used. It is equally important for the firefighter to deliver the correct rate of water flow to suppress any volume of fire. Fire fighting is hard work. Knowing how to use appliances, adapters and hose tools will make the job easier than it would be without all of these devices. It is important to know the right tool for the job.

PRESENTATION

ENABLING OBJECTIVE #1

The Firefighter II candidate given a selection of adapters shall correctly identify in writing each item, state its purpose, and describe its use.

1. Provide definitions of fittings and adapters.
2. Give examples of different adapters and fittings and their use.
 - a) Reducers.
 - b) Threaded couplings.
 - c) Sexless couplings.
 - d) Snap couplings.
 - e) Double males.
 - f) Double females.
 - g) 30 and 45 degree elbows.

Reference:
Delmar Handbook 3rd edition, pages 260-262

J&B Fundamentals 2nd edition, pages 467-469, 479-482
IFSTA Essentials 5th edition, pages 647-648

PRESENTATION

ENABLING OBJECTIVE #2

The Firefighter II candidate when given a selection of appliances shall correctly identify in writing each item, state its purpose, and describe its use.

1. Provide a definition of appliances.
2. Give examples of different appliances and their use.
 - a) Valves.
 - b) Valve devices.
 - c) Water thief.
 - d) Large diameter hose.

Reference:

Delmar Handbook 3rd edition, pages 255-257, 260-262
J&B Fundamentals 2nd edition, pages 479-482
IFSTA Essentials 5th edition, pages 643

PRESENTATION

ENABLING OBJECTIVES #3

The Firefighter II candidate, when given a selection of hose tools shall correctly identify in writing each item, state its purpose, and describe its use.

1. Provide a definition of hose tools.
2. Give examples of different hose tools and their use.
 - a) Hose roller.
 - b) Hose jacket.
 - c) Hose clamp.
 - d) Hose ramps.
 - e) Spanner wrenches.
 - f) Hydrant wrenches.
 - g) Chafing blocks.
 - h) Hose strap.

Reference:

Delmar Handbook 3rd edition, pages 260-262

J&B Fundamentals 2nd edition, pages 481-482
IFSTA Essentials 5th edition, pages 648-652

APPLICATION

When performing this application the instructor should use the equipment that the fire department uses or may be required to use.

Use a training area with a drill tower or two level acquired structure, and a minimum of one pumper with hose.

Evolutions that can be performed include:

1. Perform a reverse lay with a pumper that has its hose packed for a forward lay. Require that water flow be established.
2. Advance hose lines into the upper floors of a structure through a window. Require the hose be protected from rough surfaces or sharp edges.
3. Extend smaller diameter attack hose lines from an existing larger diameter attack line.
4. Using a hose jacket, simulate patching a burst section of hose, or use the hose jacket to connect two sections of mismatched hose.
5. Demonstrate the correct and safe operation of a hose clamp.
6. Demonstrate the uses of hose straps.

NOTE: Another resource that can be used is NFPA 1410 Standard, Initial Fire Attack Evolutions. This standard describes additional hose evolutions and timed events that can be used in firefighter training.

SUMMARY

Review the use of fittings and adapters.

Review the use of appliances.

Emphasize the importance of the appropriate use of hose tools.

LESSON THREE

FIREFIGHTER II

Fire Hose, Appliances and Streams

DOMAIN: PSYCHOMOTOR

LEVEL OF LEARNING: APPLICATION

MATERIALS

IFSTA Essentials 5th edition or Jones and Bartlett Fundamentals of Fire Fighter Skills 2nd Edition or Delmar Firefighter's Handbook 3rd Edition; NFPA 1962, Standard for the Care, Use, and Service Testing of Fire Hose, Including Couplings and Nozzles; overhead projector or laptop computer and multimedia projector; projection screen; Class A pumper.

NFPA 1001 JPR, 2008 edition

6.5.5 Perform an annual service test on fire hose

Junior Member Statement:

Junior Member training activities should be supervised by qualified instructors to assure that the cognitive and psychomotor skills are completed in a safe and non-evasive manner. While it is critical that instructors be constantly aware of the capabilities of all students both mentally and physically to complete certain tasks safely and successfully, the instructor should take every opportunity to discuss with departmental leaders and students the maturity and job awareness each participant has for the hazards associated with fire and rescue training.

TERMINAL OBJECTIVE

The Firefighter II candidate shall correctly demonstrate inspection, and annual service testing of fire hose.

ENABLING OBJECTIVES

1. The Firefighter II candidate when given a section of fire hose shall correctly demonstrate the procedures for inspecting and testing of fire hose and couplings.

LESSON THREE

FIREFIGHTER II

Fire Hose, Appliances and Streams

MOTIVATION

Fire hose may be the most important component in fire extinguishing efforts outside of the firefighters. Sending water through fire hose, from the supply point to the nozzle, is a process that is often taken for granted. To insure the confidence firefighters must have in fire hose, it must be cleaned after each use, properly maintained, and service tested annually. Fire hose that is properly cleaned, maintained, and tested is not only safer but will have a longer service life. All too often firefighter's lives depend on the integrity of their hose line.

PRESENTATION

ENABLING OBJECTIVE #1

The Firefighter II candidate when given a section of fire hose shall correctly demonstrate the procedures for inspecting and testing of fire hose and couplings.

1. Discuss the two types of hose service testing.
 - a) Acceptance testing.
 - b) Service testing.
2. Explain the reasons for service testing fire hose and couplings.
3. Discuss the requirements for a good hose-testing site.
4. Discuss the proper equipment needed to service test hose.
5. Discuss, describe, and demonstrate the procedures for service testing fire hose and standpipe hose.

Reference: .
Delmar Handbook 3rd edition, pages 315-316
J&B Fundamentals 2nd edition, pages 476-478
NFPA 1962, Standard for the Care, Use, and Service
Testing of Fire Hose Including Couplings and Nozzles.

APPLICATION

Perform an annual hose service test using a pumper and a minimum of two 250 ft. lines of fire hose with nozzles.

SUMMARY

Re-emphasize the need for annual service testing of hose.

Restate the steps for the annual service testing on fire hose.