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| **TEXAS CTE LESSON PLAN**[www.txcte.org](http://www.txcte.org) |
| **Lesson Identification and TEKS Addressed** |
| **Career Cluster** | Law, Public Safety, Corrections, & Security |
| **Course Name** | Firefighter II |
| **Lesson/Unit Title** | Loss Control |
| **TEKS Student Expectations** | **130.335. (c) Knowledge and Skills**(9) The student explains the duties of a firefighter after a fire. (A) The student is expected to explain how debris is handled from fires, including house fires and chemical fires(B) The student is expected to describe the duties for gathering information that may lead to the determination of the fire cause(C) The student is expected to identify the proper procedure for restoration of the premises after a fire |
| **Basic Direct Teach Lesson**(Includes Special Education Modifications/Accommodations and one English Language Proficiency Standards (ELPS) Strategy) |
| **Instructional Objectives** | The student will be able to:1. Explain the philosophy of loss control
2. Discuss overhaul operations
3. Discuss locating hidden fires
4. Explain safe debris removal
5. Explain the firefighter’s responsibility in preserving evidence
6. Discuss the proper procedure for restoring a fire scene prior to returning it to the occupant
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| **Rationale** | If loss control at a fire scene is not properly conducted there is a danger of rekindles, lost evidence, and greater damage to the structure than was caused by the initial incident. Loss control consists of, but is not limited to, salvage and overhaul, as well as preserving and protecting evidence that may be used by investigative personnel to determine the origin and cause of the fire. |
| **Duration of Lesson** | 2-hour lecture2-hour skill demonstration |
| **Word Wall/Key Vocabulary***(ELPS c1a,c,f; c2b; c3a,b,d; c4c; c5b) PDAS II(5)* | * 1. Customer Service – the quality of an organization’s relationship with individuals, both internal and external, who have contact with the organization
	2. Loss Control – the practice of minimizing damage and providing customer service through effective mitigation and recovery efforts before, during, and after an incident
	3. Loss Control Risk Analysis – the process in which specific potential risks are identified and evaluated; the goal is to develop strategies to minimize the impact of these risks
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| **Materials/Specialized Equipment Needed** | * Salvage covers
* Runners
* Tarps
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| **Anticipatory Set**(May include pre-assessment for prior knowledge) | Engage the students in a discussion about customer service. As a public service employee, the public is in fact our employer and pays for the service with tax dollars. Because so much of a firefighter’s image is to inherently destructive, while forcing entry into a building, ventilating a roof, and discharging copious amounts of water to extinguish a fire, many citizens are unaware of the care and concern firefighters have for their property, and the effort they put forth to protect it. The loss control methods employed by firefighters can greatly improve our image for the communities we are pledged to serve. Use the Discussion Rubric for assessment. |
| **Direct Instruction \*** | 1. Salvage *–* methods and operating procedures firefighters use to save property and reduce damage from water, smoke, heat, and exposure during or immediately after a fire, by removing property from the fire area and protecting it from further damage
	1. Develop Standard Operating Procedures (SOPs) to address coordinated efforts and results during salvage operations
	2. Preplanning for residential and commercial occupancies to protect valuable contents related to the occupancy type
		1. Residential – furniture, bedding, photographs, important documents, art, etc.
		2. Commercial – business records, cash, furniture, computers, filing cabinets, etc.
	3. Training firefighters in the use of salvage covers and floor runners to perform salvage operations efficiently
2. Salvage covers and equipment
	1. Salvage covers are waterproof, and can be made of cotton duck, plastic, or other materials that will protect unaffected furniture and building areas from heat, smoke, and water damage.
	2. Also known as tarps or tarpaulins
	3. Salvage cover sizes
		1. 9 x 12 feet
		2. 12 x 14 feet
		3. 12 x 18 feet
		4. 14 x 18 feet
	4. Floor runner sizes
		1. Widths of 24, 27, 30, and 36 inches
		2. Lengths of 10, 20, 30, 40, and 50 feet
	5. Equipment
		1. Should be in readily accessible areas on the apparatus
		2. Typical equipment carried on an apparatus:
			1. Electricians pliers, side cutters, chisels
			2. Tin snips, roof cutter, adjustable wrenches
			3. Pipe wrenches, hammer(s), sledge hammer
			4. Various saws, knifes, bars, screwdrivers
			5. Battery-operated tools, hydraulic jack, screws/nails
			6. Plastic sheeting, wooden wedges, and plugs
			7. Sawdust, mops, squeegees, scoop shovels
			8. Brooms, mops, sprinkler kits, water vacuum
			9. Submersible pump, sponges, chamois, paper towels
			10. Rags, electrical extension cables, adapters
			11. Salvage covers, “J” hooks, “S” hooks, floor runners
			12. Duct tape, plastic bags, rope, bungee cords
	6. Salvage cover rolls and folds
		1. One-firefighter spread with a rolled salvage cover: one person can quickly unroll a cover across the top of an object and unfold it.
		2. One-firefighter spread with a folded salvage cover: some departments carry folded covers instead of rolled. Two firefighters are required to fold the cover, but one firefighter can deploy it.
	7. Two-firefighter spread with a folded salvage cover:
		1. Some large covers cannot be handled by one firefighter alone.
		2. The balloon throw is the most common method for two firefighters to deploy a large salvage cover.
3. Water chutes and catchalls
	1. A water chute can be constructed with a salvage cover or floor runner wrapped around two pike poles.
	2. Catchalls are retaining basins, usually made from salvage covers, that catch water dripping from above.
4. Covering openings
	1. Exterior openings must be secured before leaving the premises.
	2. Cover any doors, windows, or other openings that have been opened or removed, using plywood, plastic, or other materials to keep out the weather.
	3. Cover roof openings with plywood, plastic, etc.
	4. Make sure the premises are secure before leaving; use padlocks, hammers, nails, etc.
5. Overhaul – those operations and activities conducted once the main body of the fire has been extinguished.
	1. Overhauls consist of
		1. Searching for and extinguishing hidden fires
		2. Placing the building and its contents in a safe condition
		3. Determining the cause of the fire
		4. Preserving evidence of arson
	2. Overhaul should not begin until authorized by the Incident Commander (IC), the fire investigator in charge of the investigation.
6. Fire Safety during overhaul
	1. Safety is a major concern during overhaul.
	2. Steps to establishing safe conditions during overhaul
		1. Inspect the premises for dangers.
		2. Develop an operational plan.
		3. Provide personnel the needed tools and equipment to work safely.
		4. Eliminate existing hazards (utilities, etc.).
		5. Firefighters must wear Personal Protective Equipment (PPE), including Self-Contained Breathing Apparatus (SCBA), until all fire has been extinguished, ventilation is completed, and the atmosphere has been proven safe for lower levels of protection.
	3. Situational awareness for firefighters during overhaul is important.
	4. Additional safety considerations during overhaul operations
		1. Continue to work in teams of two or more.
		2. Maintain awareness of available exit routes.
		3. Maintain a Rapid Intervention Crew (RIC) throughout the operation.
		4. Monitor personnel for needed rehab.
		5. Beware of hidden gas or electrical utilities.
		6. Continue using the accountability system until the incident is terminated.
7. Locating Hidden Fires
	1. Begin by evaluating the condition of the area to be searched for hidden fires. Two factors to consider that affect the stability of the building:
		1. The intensity of the fire determines the extent to which structural members have been weakened.
		2. The amount of water used for extinguishment due to additional weight placed on the floors and walls
	2. When evaluating structural stability, consider the following indicators:
		1. Weakened floors due to floor joists being burned away
		2. Concrete that has spalled due to heat
		3. Weakened steel roof members (the tensile strength of steel is affected at about 500 degrees F)
		4. Walls offset because of elongation of steel roof supports
		5. Weakened roof trusses due to burn-through of key members
		6. Mortar in wall joints opened due to excessive heat
		7. Wall ties holding veneer or curtain walls melted from heat
		8. Heavy storage on mezzanines or upper floors
		9. Water pooled on upper floors
		10. Large quantities of wet insulation
	3. Firefighters may be able to detect fires by sight, touch, sound, or electronic sensors
		1. Sight
			1. Discoloration of materials
			2. Peeling paint, cracked plaster, and rippled wall paper
			3. Smoke emissions from cracks and burned areas
		2. With the back of the hand, touch and feel the walls and floors for heat.
		3. Sound
			1. Popping or cracking of fire burning
			2. Hissing of steam
		4. Electronic sensors
			1. Thermal (heat) signature detection with thermal imaging
			2. Camera
			3. Infrared heat detection
8. Overhaul Procedures
	1. Typically, overhaul begins in the most severe fire involvement.
	2. Should begin as soon as possible after the fire is declared under control
	3. Carried out systematically:
		1. Determine the path of travel
		2. Remove necessary material to check for extension of the fire
	4. Have a basic understanding of building construction
9. Protecting Fire Scene Evidence
	1. In most jurisdictions, the fire chief has the legal responsibility for determining the cause and origin of a fire. The fire chief may delegate his authority to fire officers, fire investigators, or firefighters.
	2. The first arriving firefighters should observe any unusual conditions that may indicate an incendiary fire.
		1. Vehicles and people present in the area
		2. The status of doors and windows (locked or open)
		3. Evidence of forced entry by anyone other than firefighters
		4. Contents of the room (Are the rooms in expected order, ransacked, unusually bare, or absent of furnishings?)
		5. Indications of unusual fire behavior or more than one point of origin
	3. En route, firefighters should make mental note of the following:
		1. Time of day
		2. The weather and natural hazards
		3. Barriers that block fire department access
		4. People leaving the scene in haste; most people are intrigued by fire and remain at the scene to watch
	4. Upon arrival at the scene, firefighters should take notice of the following:
		1. The time of arrival and the extent of the fire, noting the color and movement of smoke and flames
		2. Wind direction and velocity
		3. Whether doors and windows are locked or unlocked
		4. Fire location – this information may help determine the origin of the fire.
		5. Containers or cans that may have been used to transport accelerants
		6. Burglary tools such as, pry bars, screwdrivers, etc.; they may have been used to break into the building.
		7. Familiar faces – notice people who are seen at numerous fires; they may be habitual fire setters.
	5. Observations made during firefighting operations *–* Continue making observations that may lead to the determination of the fire’s cause.
		1. Unusual odors
		2. Abnormal behavior of the fire when water was applied may indicate the use of an accelerant.
		3. Obstacles hindering firefighting such as doors nailed shut, furniture placed in front of doors, and hallways that could impede firefighters
		4. Incendiary devices – material or chemicals designed and used to start a fire
		5. Trailers – combustible materials, such as rolled rags, blankets, newspapers, or flammable liquid are often used to intentionally set fires to spread fire from one point or area to other points or areas.
		6. Structural alterations – alterations made to expose wood or other combustible materials that can allow a fire to spread quickly through a structure
		7. Fire patterns – note fire movement and intensity patterns.
		8. Heat intensity – look for evidence of high heat intensity.
		9. Availability of documents – a lack of important documents may indicate that the fire was planned.
		10. Fire detection and protection systems – check for tampering, such as being shut off.
		11. Intrusion alarms – check for tampering, such as being shut off.
		12. Location of the fire – look for possible ignition sources.
		13. Personal possessions – have items been removed or replaced?
		14. Household items – have items been removed or replaced with cheaper items?
		15. Equipment or inventory – look for obsolete equipment or inventory because this may be an indicator of a set fire.
		16. Business records – check for location change; they may have been moved to be endangered by the fire.
10. A Firefighter’s Responsibility after the Fire
	1. As a firefighter, you have two responsibilities after a fire. One is to gather information that may lead to a fire cause determination, and this is very different from your responsibility restoring the premises to residents after an accidental fire, while conducting loss control activities.
	2. When a fire remains under investigation, your responsibilities are as follows:
		1. Once investigators have completed their work, firefighters should continue to preserve evidence and control the scene.
		2. The scene may have to be secured by a law enforcement agency, such as the police department or fire marshal’s office.
		3. Legally the fire scene must remain in the possession of the fire department and under their control until the investigation is complete.
	3. In matters of loss control your responsibility is
		1. An opportunity to put your department in a good light with your community
		2. Minimizing damage to the structure and its contents during and after fire control operations; this is the core of the fire service mission: “To Save Lives and Property.”
		3. Making sure the community will appreciate your efforts you serve
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| **Guided Practice \*** | Demonstrate the following activities: provide the students with practice time, and then assess the student performance with the included checklists.* Roll a Salvage Cover for a One-Firefighter Spread
* Spread a Rolled Salvage Cover One-Firefighter Method
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| **Independent Practice/Laboratory Experience/Differentiated Activities \*** |  |
| **Lesson Closure** |  |
| **Summative/End of Lesson Assessment \***  | * Loss Control Quiz and Key
* Roll a Salvage Cover for a One-Firefighter Spread Checklist
* Spread a Rolled Salvage Cover One-Firefighter Method Checklist
* Discussion Rubric
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| **References/Resources/****Teacher Preparation** | * ISBN: 0135151112, *Essentials of Firefighting* (5th Edition), International Fire Service Training Association (IFSTA)
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| **Additional Required Components** |
| **English Language Proficiency Standards (ELPS) Strategies** |  |
| **College and Career Readiness Connection[[1]](#footnote-1)** | I. Nature of Science: Scientific Ways of Learning and Thinking C. Collaborative and safe working practices1. Collaborate on joint projects.
2. Understand and apply safe procedures in the laboratory and field, including chemical, electrical, and fire safety and safe handling of live or preserved organisms.
3. Demonstrate skill in the safe use of a wide variety of apparatuses, equipment, techniques, and procedures.
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| **Recommended Strategies** |
| **Reading Strategies** |  |
| **Quotes** |  |
| **Multimedia/Visual Strategy****Presentation Slides + One Additional Technology Connection** |  |
| **Graphic Organizers/Handout** |  |
| **Writing Strategies****Journal Entries + 1 Additional Writing Strategy** |  |
| **Communication****90 Second Speech Topics** |  |
| **Other Essential Lesson Components** |
| **Enrichment Activity**(e.g., homework assignment) | For enrichment, students will participate in skills development and practice related to loss control. |
| **Family/Community Connection** |  |
| **CTSO connection(s)** | SkillsUSA |
| **Service Learning Projects** |  |
| **Lesson Notes** |  |

1. Visit the Texas College and Career Readiness Standards at <http://www.thecb.state.tx.us/collegereadiness/CRS.pdf>, Texas Higher Education Coordinating Board (THECB), 2009. [↑](#footnote-ref-1)