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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, and Security |
| **Course Name** | Principles of Law, Public Safety, Corrections, and Security |
| **Lesson/Unit Title** | Safety with Hazardous Materials in the Workplace |
| **TEKS Student Expectations** | **130.332. (c) Knowledge and Skills**  (5) The student implements measures to maintain safe and healthful working conditions in a law and public safety environment.  (B) The student is expected to create and recommend strategies for issues related to the safety and health of employees based on an assessment of a simulated workplace environment  (C) The student is expected to discuss methods for safe handling of hazardous materials |
| **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:   * Define key terms * Identify the categories of hazardous materials * List common hazardous materials * Discuss methods for safe handling of hazardous materials * Use special requirements for handling hazardous materials to maintain a safe working environment * Recommend strategies for issues related to the safety and health of employees based on an assessment of a simulated workplace environment |
| **Rationale** | LPSCS employees often work in dangerous environments with and without hazardous materials. In order to stay safe, they must be able to recognize the dangers and handle the hazardous materials safely. |
| **Duration of Lesson** | 2 hours |
| **Word Wall/Key Vocabulary**  *(ELPS c1a,c,f; c2b; c3a,b,d; c4c; c5b) PDAS II(5)* | See Outline |
| **Materials/Specialized Equipment Needed** | **Materials**   * Computers with Internet access * Discussion Rubric * Group Evaluation Rubric * Research Rubric * Role Play Rubric * Writing Rubric |
| **Anticipatory Set**  (May include pre-assessment for prior knowledge) | Discuss as a class the hazardous materials that might be encountered in an LPSCS environment. Have students think about industry, medical facilities, criminal acts, body fluids, cleaning needs, etc. Use the following questions for the discussion and the Discussion Rubric for assessment.   * What precautionary steps need to be taken in each of these situations? * What are the dangers involved in each of these scenarios? |
| **Direct Instruction \*** | 1. Key Terms    1. **Hazardous** **Materials** – materials that, because of their quantity, concentration, or physical or chemical characteristics, pose a significant present or potential hazard to human health and safety, or to the environment or workplace if released    2. **Hazardous** **Waste** – waste that, because of quantity or concentration, or physical, chemical, or infectious characteristics, may either cause or significantly increase substantial present or potential hazards to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed 2. Categories of Hazardous Materials    1. Radioactive Materials – contain atoms with unstable nuclei that spontaneously emit ionizing radiation to increase their stability    2. Radioactive Waste – radioactive materials that are discarded; usually the product of a nuclear process such as nuclear fission, though industries not directly connected to the nuclear power industry may also produce radioactive waste    3. Biohazardous Materials – materials containing infectious agents (bacteria, molds, parasites, viruses) that normally cause or significantly contribute to human mortality, or organisms capable of being communicated by invading and multiplying in bodily tissues    4. Medical Waste – both biohazardous wastes and sharps (devices capable of cutting or piercing, such as hypodermic needles, razor blades, or broken glass) resulting from the diagnosis, treatment, or immunization of human beings, or research pertaining to these activities   III. Common Hazardous Materials   * 1. Fuels (gasoline, butane, propane) and items containing fuel   2. Perfumes, aftershaves, cologne   3. Cosmetics (nail polish/remover, astringent)   4. Aerosols (spray paint, hair spray)   5. Cleaning supplies (ammonia, bleach)   6. Household solvents (turpentine, acetone, mineral spirits)   7. Paints (oil and solvent-based) and paint thinner   8. Pesticides, herbicides, rodenticides   9. Matches   10. Batteries (lithium, wet cell)   IV. Handling Hazardous Materials   1. Protective Measures    1. When possible use the engineering controls, such as local exhaust and general ventilation, to limit airborne contaminates    2. Wear personal protective gear such as safety glasses, hearing protection, gloves, and respirators 2. Spill Procedures    1. Plan of Action       1. Identify the potential location of spills       2. Identify the quantities of material(s) that might be released       3. Identify the chemical and/or physical properties of the material(s)       4. Identify the hazardous properties of the material(s)       5. Confirm the locations and contents of spill kits 3. General Procedures    1. Turn off all ignitions and heat sources if the spill is flammable    2. Attend to any person who may have been contaminated    3. Notify any individuals in the area of the spill    4. Evacuate the nonessential personnel    5. Avoid breathing the vapors of the spilled materials    6. Establish a method of exhaust or ventilation 4. First Aid procedures    1. Eye contact       1. If a chemical is splashed into the eye, immediately wash the eye and the inner surface of the eyelid with water for 15 minutes       2. Seek medical attention       3. Remove contacts lenses if wearing any    2. Minor skin contact – flush with water and remove the contaminated clothing    3. Major skin contact       1. If a chemical is spilled over a large area, remove the contaminated clothing while using the shower       2. Wash off the chemicals with a mild detergent or soap and water    4. Ingestion – call poison control and seek medical attention immediately   E. Spill Kits   * 1. Spill – any time that blood or other possibly infectious materials (OPIM) have contaminated items or areas, or contamination with dried or caked-on blood, or any fluids visibly contaminated with blood   2. Contents      1. Neutralizing agents (i.e. sodium carbonate, sodium bicarbonate, or sodium bisulfite)      2. Absorbents (vermiculite or absorbent pillows or dikes)   (*Note*: paper towels, rags, and sponges may be used, but only with caution because some chemicals may ignite upon contact with them)   * + 1. Plastic scoops and shovels     2. Disposable mops     3. Disposable protective clothing     4. Containers to receive the spilled material and all of the items used during the cleanup     5. Bottle of disinfectant     6. Two pairs of gloves     7. Rags     8. Clear plastic bag     9. Red biohazard bag     10. Alcohol wipes   1. Use Procedures      1. Remove the contents from the spill kit package      2. Open the plastic bags so that items can be easily deposited without touching the outside of the bag; then set the bag to the side      3. Remove all jewelry      4. Put on gloves      5. Place the contaminated sharps in a sharps container from the medical department   2. Remove the sharps from the spill      1. Do not touch the sharps with your hands      2. Place the sharps in the sharps container      3. Avoid contaminating the outside of the sharps container   3. Place the appropriate absorbent (i.e. paper towels) on the spill      1. If the soiled absorbents are saturated, place them in the red biohazard bag      2. If the soiled absorbents are not saturated, place them in the clear plastic bag   4. Apply a disinfectant liberally to the infected area      1. Place the used bottle of disinfectant in the clear plastic bag      2. Allow the disinfectant to sit on the surface   5. Use the rags to soak up the disinfectant      1. Saturated rags go in the red biohazard bag      2. Non-saturated rags go in the clear plastic bag   6. Seal the red biohazard bag while keeping it upright to prevent fluids from leaking out   7. Remove the gloves      1. Pinch the glove approximately a ½-inch from the cuff and turn the glove inside-out      2. Do not touch your exposed skin with the outside surface of the gloves      3. Slide your free hand underneath the cuff of the remaining glove and turn it inside-out   8. Seal the clear plastic bag   9. Wash hands thoroughly      1. Use warm water      2. Use antibacterial soap      3. Scrub well      4. Rinse thoroughly  1. Contaminated linens    1. Put on gloves    2. Seal the soiled linen in a water-soluble bag    3. Place the water-soluble bag inside a yellow biohazard bag    4. Take the yellow (contaminated linen) bag to the laundry for treatment   *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*  None |
| **Guided Practice \*** | *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*  None |
| **Independent Practice/Laboratory Experience/Differentiated Activities \*** | Have students research <http://www.osha.gov/>for common issues of health and safety in the workplace. Require the students to find three health and safety related concerns that might apply to a LPSCS workplace or environment, and provide the statistical information related to those concerns. Then have the students share the results of their research with the class.  Divide the students into groups. Have the groups brainstorm solutions to these concerns. Have each group recommend a strategy to avoid one concern and create a scenario (written or role played) within a simulated LPSCS work environment. Use the Research Rubric, the Group Evaluation Rubric, and the Writing Rubric or the Role Play Rubric.  *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*  none |
| **Lesson Closure** |  |
| **Summative/End of Lesson Assessment \*** | Safety with Hazardous Materials in the Workplace Exam and Key  *Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*  For reinforcement, students will research the classifications of hazardous materials. Once they have established the classes, they will then work in groups to determine which of these types of materials might be used in the LPSCS workplace. Use the Research Rubric and the Group Evaluation Rubric for assessment. |
| **References/Resources/**  **Teacher Preparation** | [www.apwu.org](http://www.apwu.org/)  [www.safety.fsu.edu/hazmatmanual.html](http://www.safety.fsu.edu/hazmatmanual.html)  [www.ci.los-alamitos.ca.us](http://www.ci.los-alamitos.ca.us/)  TDCJ Correctional Officer Academy Curriculum, Hazardous Materials video |
| **Additional Required Components** | |
| **English Language Proficiency Standards (ELPS) Strategies** |  |
| **College and Career Readiness Connection[[1]](#footnote-1)** | **Cross-Disciplinary Standards**  I. Key Cognitive Skills  D. Academic behaviors   1. Self-monitor learning needs and seek assistance when needed. 2. Use study habits necessary to manage academic pursuits and requirements. 3. Strive for accuracy and precision. 4. Persevere to complete and master tasks. |
| **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 select an area of a prison that uses hazardous materials daily. Then the students will write a policy for handling those hazardous materials. For example, if the students choose the laundry services they must identify the hazardous materials (i.e. detergent, bleach, disinfectant), create a policy for the storage and handling of the materials, and create a procedure for handling spills and contact with materials. Use the Writing Rubric for assessment. |
| **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)