

Basic Fire Safety

Course

Health Science I

Unit

Safety and Body Mechanics

Essential Question

What is required to prevent or respond to a fire?

TEKS

121.3 6B, 6C, 11C, 11D

TAKS

ELA 1, 2, 4, 5, 6
Science 4

Prior Student Learning

Prior scientific study of chemicals and fire safety.

Estimated time

3-4 hours

Rationale

Health care workers must be alert to the causes of fire and act to prevent fires when possible.

Objectives

Upon completion of this lesson, the student will be able to:

- Appraise fire prevention practices in the work place;
- Recognize the meanings of the acronyms PASS and RACE; and
- Compare and contrast types of fire extinguishers.

Engage

Invite a representative from the local fire department to implement the lesson.

OR

Show a fire extinguisher and ask for student experiences either with fire or fire extinguishers. Have a general class discussion of what is required for a fire to start and stay burning.

Key Points

- I. Fires need three things in order to start
 - A. Oxygen (air)
 - B. Fuel (any material that will burn)
 - C. Heat (sparks, matches, flames)
 1. If any of the three things are eliminated the fire will go out.
 - a. If there is a small fire in a pan on the stove and a lid is put on it, the fire will go out with the elimination of oxygen.
- II. Major causes of fire
 - A. Carelessness with smoking and matches
 - B. Misuse of electricity
 1. Overloading a circuit or overuse of extension cords
 - C. Improper rubbish disposal
 - D. Improper storage of flammables (such as gasoline)
 - E. Arson
- III. Types of fires
 - A. Class A Fire
 1. Ordinary combustibles, such as trash, wood and paper
 - B. Class B Fire
 1. Flammable liquids, such as grease, gasoline, oil, etc.
 - C. Class C Fire
 1. Electrically energized fires

- D. Class D Fire
 - 1. Flammable metals
- E. Class K Fire
 - 1. Fires involving combustible cooking fluids such as oils and fats.
 - 2. Your present fire extinguishing equipment may not put out a fire involving vegetable oil in a deep fat fryer.
- IV. Equipment
 - A. Faulty equipment and the improper use of equipment are major causes of fire in health care facilities.
 - B. Appropriate departments should check and maintain all equipment on a routine schedule.
 - 1. Clean lint and grease from laundry and cooking equipment, ventilator hoods, filters, and ducts on a regular basis.
 - 2. All staff should check for and report any cracked or split cords or plugs on the equipment used.
 - 3. Avoid using extension cords whenever possible.
 - a. If must be used, check specified amperage load is not exceeded.
 - b. Do not run extension cords across doorways or anywhere they can be stepped on.
 - c. Do not plug one extension cord into another and never plug more than one extension cord into an outlet.
- V. General Fire Safety
 - A. Keep combustibles, such as paper products, linens, and clothing, away from heat producing devices.
 - B. Do not allow devices that produce sparks, including motor driven toys or appliances, in patient areas where oxygen is used.
 - C. Store gas cylinders securely, away from patients. Cap cylinders when they are not in use.
 - D. Keep maintenance and storage areas clean and free of trash, sawdust, wood shavings, oily rags, and other hazards.
 - E. Keep halls and stairways clear.
 - F. Be sure that EXIT signs are always lighted and that emergency lighting is in working order.
 - G. Never prop open emergency doors. Fire doors not only let people out, but they keep fire from spreading.
- VI. In the event of a fire, the most important rule is to stay calm and to set an example for patients. Many health care facilities use an acronym when training employees in fire safety, such as RACE:
 - A. **R** – Rescue any patient in immediate danger.
 - B. **A** – Pull the alarm and notify other employees of the location and type of fire.
 - C. **C** – Contain the fire by closing doors and windows – many facilities have fire doors that automatically close when the alarm is tripped, but patient's doors may need to be shut to

slow down the smoke and fire.

- D. **E** – Extinguish the fire or evacuate the area if the fire is too large.
- E. If the fire is small, confined to one area and personal safety is not endangered, determine what type of fire it is and use the proper extinguisher.

VII. Types of Fire Extinguishers

- A. Portable extinguishers store specific “extinguishing agents” which are expelled into the fire.
- B. Pressurized water extinguishers are appropriate for use on Class A fires only.
 - 1. These must never be used on electrical or flammable-liquid fires.
- C. Dry Chemical extinguishers blanket burning materials with powdered chemicals.
 - 1. In some models, the chemicals are stored under pressure.
 - 2. In others, the chemicals are expelled by pressure supplied by a separate gas-filled cartridge.
 - 3. The dry chemical extinguishers can be corrosive if not cleaned immediately.
 - 4. A B C Dry Chemical extinguishers
 - a. Contain ammonium phosphate and can be use on Class A, B, and C fires.
 - b. Should never be used on a fire in a commercial grease fryer because of the possibility the fire may re-ignite (re-flash) and because it will render the unit’s automatic fire-protection system ineffective.
 - 5. B C Dry Chemical extinguishers,
 - a. Suitable for fighting Class B and C fires,
 - b. Contain either sodium bicarbonate or potassium bicarbonate.
 - c. Are preferred over other dry-chemical extinguishers for fighting grease fires.
 - d. Potassium bicarbonate, urea-base potassium bicarbonate, and potassium chloride extinguishers can put out larger fires than extinguishers using sodium bicarbonate.
 - e. Where provided, an extinguishing system protecting cooking appliances is always activated first.
 - 6. Class K Dry and wet chemical extinguishers for commercial kitchen fires.
 - a. Required to be installed in all applicable restaurant kitchens.
 - b. Once a fire starts in a deep fryer, it cannot always be extinguished by traditional range hoods or Class B extinguishers.
- D. Carbon dioxide extinguishers contain pressurized liquid carbon

- dioxide, which turns to gas when expelled.
 - 1. Rated for use on Class B and C fires.
 - 2. Carbon dioxide is not corrosive.
 - 3. Never use CO₂ extinguishers in a confined space while people are present without proper respiratory protection.
 - E. Foam (or AFFF and FFFP) extinguishers
 - 1. Blanket the surface of a burning flammable liquid.
 - a. Excludes air and puts out the fire.
 - 2. Since foams contain mostly water which conducts electricity, foam extinguishers cannot be used on electrical fires.
 - F. Extinguishers for Class D fires must match the type of metal that is burning.
 - 1. These extinguishers do not use numerical ratings.
 - 2. Extinguishers for Class D fires are labeled with a list detailing the metals that match the dry powder in the extinguisher.
- VIII. Using a portable fire extinguisher: **PASS**
- A. Keep your back to an exit and stand 10 to 20 feet away from the fire.
 - B. Follow the four-step PASS procedure.
 - 1. **P- PULL the pin:**
 - a. This unlocks the operating lever and allows you to discharge the extinguisher.
 - b. Some extinguishers may have other lever-release mechanisms.
 - 2. **A- AIM low:**
 - a. Point the extinguisher hose (or nozzle) at the base of the fire.
 - 3. **SS- SQUEEZE from Side to side:**
 - a. Moving carefully toward the fire, keep the extinguisher aimed at the base of the fire and sweep back and forth until the flames appear to be out.
 - b. Watch the fire area.
 - c. If the fire re-ignites, repeat the process.
 - d. Always be sure the fire department inspects the fire site.

Warning: Portable fire extinguishers discharge faster than most people think – most within 30 seconds.

Activities

- I. Develop a pamphlet demonstrating the proper use of a fire extinguisher.
- II. Complete Basic Fire Safety Worksheet.
- III. Go to the OSHA fire extinguisher website, work through the information and take the self quiz.
<http://www.osha.gov/SLTC/etools/evacuation/portable.html>

Materials

Local fire department
Fire Extinguisher

Accommodations for Learning Differences

For reinforcement, the student will outline the steps of using a fire extinguisher.

For enrichment, the student will design a multimedia presentation on fire safety.

National and State Education Standards

National Health Science Cluster Standards

HLC06.01 Health care workers will understand the existing and potential hazards to clients, co-workers, and self. They will prevent injury or illness through safe work practices and follow health and safety policies and procedures.

TEKS

121.3 (c) 6B identify industry safety standards;
121.3 (c) 6C demonstrate appropriate actions in emergency situations;
121.3 (c) 11C identify fire prevention and safety practices; and
121.3 (c) 11D recognize hazardous materials and situations.

Texas College Readiness Standards

English Language Arts

- I. A. 2. Generate ideas and gather information relevant to the topic and purpose, keeping careful records of outside sources.
- II. A. 4. Draw and support complex inferences from text to summarize, draw conclusions, and distinguish facts from simple assertions and opinions.

Science

- I. A. 1. Utilize skepticism, logic and professional ethics in science.

Social Studies

- I. E. 4. Identify and evaluate the sources and consequences and social conflict.

Basic Fire Safety Worksheet

Short answer

1. What three things are needed in order for a fire to burn?
2. List three rules for preventing fires.
3. List the five major causes of fires.
4. What does the acronym RACE stand for?
5. What does the acronym PASS stand for?
6. Explain the contents of a Class A fire extinguisher and on what type of fire(s) it can be used.
7. Explain the contents of a Class B fire extinguisher and on what type of fire(s) it can be used.
8. Explain the contents of a Class C fire extinguisher and on what type of fire(s) it can be used.
9. Explain the contents of a Class D fire extinguisher and on what type of fire(s) it can be used.
10. Explain the contents of a Class ABC fire extinguisher and on what type of fire(s) it can be used.

Assessment

Fire Safety Quiz (25 answers, 4 points each)

1. List the three things that fire needs to start. (3)
2. Which of the following is a major cause of fires?(1)
 - A. Lightening
 - B. Car bombs
 - C. Improper rubbish disposal
 - D. Candles
 - E. Lawn mowers
3. Which of the following is not good equipment maintenance?(1)
 - A. Clean lint and grease from equipment regularly.
 - B. Check for cracked or split electrical cords or plugs.
 - C. Plug one extension cord into another to reach equipment.
 - D. Do not run extension cords where they can be stepped on.
 - E. Keep equipment free from flammable material.

Match the following general fire safety rules to the thing to which they pertain. (6)

- A. Heat producing devices
 - B. Patient areas using oxygen
 - C. Maintenance and storage areas
 - D. Halls and stairways
 - E. Exit signs and emergency lights
 - F. Fire doors
4. Allow people to get out and stop fires.
 5. Keep combustibles, such as paper products, linens, & clothing, away from these.
 6. Keep these clear of anything on which people could trip.
 7. Do not allow devices that produce sparks here.
 8. Keep these areas clean and free of trash, wood shavings, oily rags, and other hazards.
 9. Be sure that these are in working order.
 10. Explain the meaning of the acronym RACE. (4)
 11. Explain the meaning of the acronym PASS. (4)
 12. T F Pressurized water is the safest extinguisher to use on electrical and gasoline fires. (1)

Match the following (5):

- A. Class A fire
 - B. Class K fire
 - C. CO₂ Extinguisher
 - D. Appropriate for use on Class A fires only
 - E. A B C Dry Chemical extinguishers
13. Fire of items such as trash and wood.
 14. Rated for use on Class B and C fires.
 15. Fire of combustible cooking fluids.
 16. Contain ammonium phosphate; can be use on Class A, B, and C fires.
 17. Pressurized water extinguishers.

Fire Safety Quiz Key

1. A. Air (oxygen)
 B. Fuel
 C. Heat
2. C. Improper rubbish disposal
3. C. Plug one extension cord into another to reach equipment.
4. F. Fire doors
5. A. Heat producing devices
6. A. Halls and stairways
7. B. Patient areas using oxygen
8. C. Maintenance and storage areas
9. E. Maintenance and storage areas
10. **R** – Rescue any patient in immediate danger
 A – Pull the alarm and notify other employees of the location and type of fire
 C – Contain the fire by closing doors and windows – many facilities have fire doors that automatically close when the alarm is tripped, but patient’s doors may need to be shut to slow down the smoke and fire.
 E – Extinguish the fire or evacuate the area if the fire is too large
11. **P- PULL the pin:**
 A- AIM low:
 SS- SQUEEZE from Side to side
12. False
13. A. Class A fire
14. C. CO₂ Extinguisher
15. B. Class K fire
16. E. A B C Dry Chemical extinguishers
17. D. appropriate for use on Class A fires only