

Follow Safety Procedures and Accident Prevention Techniques

Unit: Basic Skills for Family and Consumer Sciences

Problem Area: Follow Safety Practices in Laboratory Work Settings

Lesson: Follow Safety Procedures and Accident Prevention Techniques

■ **Student Learning Objectives.** Instruction in this lesson should result in students achieving the following objectives:

- 1 Identify potential risks for physical injury in the classroom laboratory and in the workplace.**
- 2 Follow safety procedures and accident prevention techniques in the classroom laboratory and in the workplace.**

■ **List of Resources.** The following resources may be useful in teaching this lesson:

Collins, Larry R., and Thomas D. Schneid. *Physical Hazards of the Workplace: Occupational Safety and Health Guide Series*. CRC, 2001.

"GFCI's Fact Sheet," *U.S. Consumer Product Safety Commission*. Accessed May 28, 2008. <<http://www.cpsc.gov/cpscpub/pubs/99.html>>.

"Heimlich Maneuver," *Heimlich Institute*. Accessed May 29, 2008. <<http://www.heimlichinstitute.org/page.php?id=34>>.

Hopwood, Dan, and Steve Thompson. *Workplace Safety: A Guide for Small and Mid-size Companies*. Wiley, 2006.

U.S. Department of Labor, Occupational Safety and Health Administration (OSHA). Accessed May 30, 2008. <<http://www.osha.gov/>>.

Wald, Peter H., and Gregg M. Stave. *Physical and Biological Hazards of the Workplace*. Wiley-AIChE, 2001.



■ **List of Equipment, Tools, Supplies, and Facilities**

- ✓ Overhead or PowerPoint projector
- ✓ Visual(s) from accompanying master(s)
- ✓ Copies of sample test, lab sheet(s), and/or other items designed for duplication
- ✓ Materials listed on duplicated items
- ✓ Computers with printers and Internet access
- ✓ Classroom resource and reference materials

■ **Terms.** The following terms are presented in this lesson (shown in bold italics):

- act of God
- Ansul fire suppression systems
- apparel accessories
- blade
- burns
- corrosives
- CPR
- electrical equipment
- fire extinguisher
- first aid
- GFCI
- hand tools
- heat detectors
- Heimlich Maneuver®
- MSDS
- OSHA
- physical hazards
- safety gloves
- signage
- smoke detectors
- traffic patterns
- uniforms

■ **Interest Approach.** Use an interest approach that will prepare the students for the lesson. Teachers often develop approaches for their unique class and student situation. A possible approach is included here.

An instructor-led question and answer session, in a “true-false” format, is one way to introduce the topic of safety and accident prevention. Ask students to answer some sample safety and accident prevention questions (as a pre-test).

1. *Fire extinguishers are designed to put out all types of fires. (F)*

2. The wearing of wrist bracelets and neck chains in classroom laboratories and workplaces is potentially hazardous to students/workers. (T)
3. Short hair may prevent an accident on the job. (T)
4. Uniforms are “job-identifying” attire. (F)
5. Motorized appliances should be unplugged before cleaning. (T)
6. OSHA studies natural dangers in the ocean. (F)
7. Safety signage may prevent an accident. (T)
8. GFCI stands for “Greater Fire Control Initiative.” (F)
9. The top step of a ladder is not designed for standing. (T)

Students should offer a rationale for their answers. Provide the correct answer and rationale during a class discussion. To wrap-up the introduction, encourage students to voice their thoughts about potential dangers in workplaces and classroom laboratories.

SUMMARY OF CONTENT AND TEACHING STRATEGIES

Objective 1: Identify potential risks for physical injury in the classroom laboratory and in the workplace.

Anticipated Problem: What are the potential risks for physical injury in the classroom laboratory and in the workplace?

- I. Potential risks for physical injury
 - A. Cuts or punctures to the skin may occur from any number of tools used in the laboratory and in the workplace. Any tool with a **blade** (sharp, honed edge) is potentially dangerous, including knives, scissors, box cutters, and insert blades for food processors or blenders. Non-bladed, but sharp objects that may cause cuts or skin punctures include forks, pizza cutters, broken glass, staplers, sharp edges, and writing utensils.
 - B. **Burns** are injuries that actually destroy the skin. Burns may be caused by heat or by chemicals.
 1. Heat burns to the skin are always a concern on the job and may result from open flames or from direct contact with hot surfaces like stoves, ovens, pots, and pans. Burns may occur due to spilling hot foods or liquids directly onto the skin or from high heat or steam coming from an enclosed area (e.g., pressure cooker or steamer) that engulfs the skin.

2. Chemical burns occur when a caustic substance comes in contact with the skin and destroys the affected area. These burns are most common when using corrosive chemicals. **Corrosives** are highly acidic chemicals that can eat through metal. Drain cleaner is a good example of a corrosive chemical that could easily burn the skin.
- C. Fire is a major risk in the classroom laboratory and in the workplace and may occur at any time and from various and numerous sources. Fire may be caused by an inadequately extinguished cigarette, grease ignited in a pot or pan, inadequate or poorly maintained wiring, a lightning strike, or a gas leak. Most fires are preventable with good safety training, but others may be termed an “**act of God**”—a natural occurrence or phenomenon, including tornados, earthquakes, and hurricanes.
- D. Back injuries, physical strains, and sprains may occur from lifting boxes or equipment that is too heavy or that was lifted incorrectly.
- E. Cuts, abrasions, broken bones, electrocution, limb loss, or worse may occur when an individual uses or cleans electrical equipment improperly. **Electrical equipment** includes any small or large hand tool or piece of machinery powered by an electrical cord that is attached to a wall outlet or by stored electrical energy in a battery.
 1. **Hand tools** are tools or appliances that can easily be lifted and used solely in the hands; they do not have to be electrical. For example, a paring knife and an electric knife are both hand tools, and both may cause serious injury.
 2. Larger machines often seem harmless but may offer unexpected dangers. For example, a 20-quart, tabletop mixer may not appear dangerous. However, if a person is scraping the inside of the bowl and the machine is accidentally switched on, serious injury could occur to the person’s hand and arm. Wearing **apparel accessories** (nonessential garments or accessories such as dangling necklaces, large rings, wrist bracelets, hoop earrings, scarves, or long belts) exacerbates this type of potential mechanical danger. Apparel accessories can easily become tangled in moving machinery (e.g., dough hooks and whip attachments), causing severe injury to the student or the worker.
- F. Slips, trips, falls, and other physical accidents are common sources of job injuries. Typical examples of **physical hazards** include slipping on a wet floor, tripping over a rug or other low-to-the-ground item, falling from a ladder, and using a ladder improperly (e.g., use of the top step or placement of a ladder on a staircase). Other physical hazards include walking into other people or into solid objects when vision is impaired, when carrying a large box or other item that impairs vision, or in poor lighting.
- G. Injuries may occur when students and workers are not wearing the required uniforms. **Uniforms** are specific types of clothing (and possibly protective garments) required by the employer when performing certain jobs.
 1. While some uniforms may simply identify a worker as an employee of a company, many uniforms may provide specific safety features for the job itself

- (e.g., rubber-soled shoes to prevent slips, gloves to prevent cuts or burns, and goggles to prevent chemical splashes in the eyes).
2. Regardless of the uniform or clothing worn, it should fit properly because loose garments can contribute to trips or falls and may become entangled in machinery.
- H. Hair may cause injury by becoming entangled in machinery, obstructing vision (leading to cuts or falls), or catching on fire.
- I. Running in a laboratory or workplace is an unacceptable practice. Running leads to collisions, falls, skids, and trips. It may be exceptionally hazardous if the person running is carrying an object. Knives, tools, boxes, or books held in the hands of someone running could seriously injure the runner or others. Sprains, cuts, and broken bones are typical injuries that result from running in the lab or in the workplace. All of these injuries result in lost time, a loss in productivity, and potential medical expenses.

Use VM–A to guide the discussion. Ask students if their parents have to wear PPE for their jobs. What is required and why? Ask the students if they have to wear PPE for anything. List their responses on the board and discuss their importance.

Objective 2: Follow safety procedures and accident prevention techniques in the classroom laboratory and in the workplace.

Anticipated Problem: What are common safety procedures and techniques to prevent injury in the classroom laboratory and in the workplace?

II. Common safety procedures and techniques

- A. The use of knives or blades requires constant care and vigilance to avoid injury. Common injuries include:
1. Handing someone a knife—The knife should be held by the dull side of the blade, and the handle should be extended to the other person.
 2. Safely carrying a knife or blade—The knife should be held by the handle with the blade pointed to the floor and at the side of the person's leg.
 3. Cleaning knives and blades—Knives or blades should never be submerged in a full sink filled with other items. An unsuspecting dish washer may suffer a severe cut from a blade that is not visible.
 4. Sharpening knives and blades—Blades should be kept properly sharpened. Dull knives require more force and pressure for cutting. It is more likely that a dull knife will slip off the object with great force, potentially cutting the hand holding the object.
 5. Using a knife—The knife should be held firmly by the handle, never by the blade. Fingers should be in a curled under position to prevent cuts. Safety gloves provide extra protection when using knives or blades. **Safety gloves** are

typically constructed from metal mesh or from a cut-resistant fabric and specially designed to protect the hand and fingers from cuts and punctures.

6. Blades and all pointed objects should be used for the purpose intended by the manufacturer.
7. Large slicing blades (e.g., slicing wheels from an automatic meat slicer) require special care. The meat slicer should be used only when the metal blade guards are in place. Safety gloves should be worn when operating the meat slicer and when handling the blade for cleaning and assembly.
8. If a knife falls from a table or counter—It is necessary to let the knife fall to the floor. Serious cuts often occur when attempting to catch a falling knife.
9. Knives should be stored in an approved knife storage unit. They should be stored with the blade covered and the handle up or exposed. Knives may be stored in a knife kit, in a drawer, or in a counter slotted holder (e.g., stainless steel, polystyrene are preferred). Knives that are flat in a drawer or on a shelf are potential hazards.

B. Heat and chemical burn avoidance

1. All chemicals should be kept in their original containers with original labels. Chemicals should be stored in a dry cabinet that is used for chemicals only and away from food and food preparation equipment.
2. All Material Safety Data Sheet (**MSDS**) forms should be read and kept. MSDS forms are included with all commercially-packaged chemicals. The forms contain the following essential information: actual chemical name (aside from the brand), antidotes and emergency care instructions (in case of ingestion or contact with eyes or skin), poison care emergency numbers, and more. MSDS forms should be posted and kept on file in a school or a business office.
3. Gloves should be worn when using any chemicals (e.g., disposable latex or other single-use gloves), including sprays.
4. Certain chemicals may require the use of protective eye goggles and/or a mask to cover the nose and mouth. When applying sprays, caution should be used to avoid breathing in the mist or vapors. Professional technicians are best qualified to apply corrosive chemicals. All labels should be read and assistance should be requested if the user is in doubt about the safe use procedures.
5. Clearly visible signage should be placed over or in front of areas known to be hot to the touch. **Signage** refers to physically posted signs offering information and/or warnings to students and workers.
6. Open flames should be avoided. However, some equipment that is hot will have no visual cues (e.g., like a flame), so it should be assumed that the handle or cover is hot. Heat-resistant gloves and mitts should be made available near stoves and ovens so pots and pans may be touched safely. Wet towels, and other fabrics and materials, should never be used to pick up hot pots and pans as wet materials provide no safety barrier from heat. In addition, latex or plastic gloves can melt onto the skin and hands when handling hot equipment, causing worse burns.

7. Special heat-resistant or non-flammable uniforms or protective equipment may be required for certain tasks. Closed-toed shoes protect the feet from hot spills and from falling items that may injure the feet or toes. Therefore, sandals and open-toed shoes are usually forbidden in the workplace.
- C. Fire safety is essential and is comprised of two primary elements: prevention training and reaction training. Both forms of training are ongoing efforts and require continuous awareness and correction of risky behaviors in addition to effective responses to active fires.
 1. Fire prevention
 - a. It is necessary to discard all boxes, paper goods, rags, leftover paint, and aerosol products that are garbage.
 - b. There should be an annual fire department inspection of Ansul or similar automatic fire extinguisher systems over stoves, ovens, fryers, and other equipment in kitchen hot stations. **Ansul fire suppression systems** consist of pipes that extend down from exhaust hoods, directly connected to a built-in fire extinguisher system that quickly puts out fires over heat-producing commercial cookware equipment. The fire department also conducts an annual inspection of any built-in sprinkler systems and all fire extinguishers.
 - c. Local fire safety codes for cardboard box storage should be followed. In many localities, boxes may be stored between 6 and 12 inches from the ceiling.
 - d. Chemicals should be stored in metal cabinets or in sealed rooms away from food and food-preparation equipment.
 - e. Oxygen or other gas tanks should be chained together, and the chain should be secured to the floor or to the ground.
 - f. Any suspicious furnace or water heater pilot lights should be inspected and/or reignited by a fire department official.
 - g. Fire extinguishers should be kept visible and should not be blocked or placed near potential fire hazards. Additionally, baking soda (a common kitchen ingredient) is useful for putting out small pan fires and should be kept close to cooking areas.
 2. Fire reaction training
 - a. The scope of the fire should be assessed. Small fires in pans on a stove or in a garbage can may be extinguished easily by cutting off the oxygen supply (e.g., by placing a lid on the pan or the can). Other small fires may require a fire extinguisher. If there is any doubt at all about the type of fire, the fire department should be called.
 - b. A **fire extinguisher** is a hand-held device that consists of a metal can (usually red) with a hose and cone coming out of the top and a spraying mechanism (handles or levers) connected to the hose. A pin inserted into the sprayer mechanism prevents the contents from discharging accidentally, even if someone squeezes the handles. The contents are held under pressure, which causes the contents to spray out quickly (the

extinguisher states the average spray time) and with force. A certified technician or the fire department should check the pressure and contents annually. Selecting the correct extinguisher is critical to putting out a fire; use of the wrong type may make the fire worse. In Family and Consumer Sciences laboratories, the common extinguisher is dry chemical in nature and comes in three classes:

- (1) Class A: This is designed for ordinary combustibles (e.g., paper, cardboard, wood, and cloth). Extinguisher designators “A” or “A/B/C” are acceptable for this type of fire. (Newer fire extinguisher will have icon designators, and older types will have the alpha designators.)
 - (2) Class B: This is designed for flammable liquids (e.g., grease, oil, shortenings, gasoline, and aerosol cans). Only Class “B” or “B/C” extinguishers should be used on flammable liquid fires. The use of Class A extinguishers would likely spread and expand the fire. Designators of “A/B”, “B/C” or “A/B/C” may be used provided the fire is not located in a deep fryer or other equipment where a large volume of burning fat is present.
 - (3) Class C: This is designed for use on electrically generated fires (e.g., frayed wires, overheated appliance motors, poor wiring, wall switches, or a fire in a toaster). Only Class “C” or “A/B/C” extinguishers should be used to suppress these fires.
- c. Using a fire extinguisher: Regardless of the type of extinguisher, the protocol for use is similar. The acronym “PASS” (pull, aim, squeeze, sweep) is a good way to remember the following steps:
- (1) Pull the pin.
 - (2) Aim the spout/hose at the base of the fire.
 - (3) Squeeze the trigger/handles.
 - (4) Sweep the contents side-to-side.
- d. An escape path from the facility should be clearly communicated. Personnel who will guide others to safety should be designated. A meeting point outside the building should be established.
- e. All fire exits should be clearly marked, and exits should be kept open and unblocked. Fire exit doors should open outwards only and should never be locked from the inside.
- f. Breathing smoke should be avoided. It is necessary to crawl or stay low while exiting the building.
- g. Smoke and/or heat detectors should be installed. **Smoke detectors** are small battery- or electric-powered units installed on walls or ceilings that emit a loud alarm when the internal sensors detect smoke at a specified level. Similarly, **heat detectors** are small battery- or electric-powered units placed in strategic locations that send out a loud alarm if high levels of heat are detected. Heat detectors are particularly useful when fire is present but smoke is not. Fire professionals should install heat detectors.

D. Proper lifting techniques

1. It is necessary to wear non-skid shoes with closed toes and to keep shoelaces short.
2. Loose-fitting clothing (that may become entangled when lifting the load) should be avoided.
3. The weight of the load (is the person able to lift the load?) should be checked. An evenly distributed weight load is easier to lift.
4. Built-in hand grips make a load easier to lift. Wearing gloves also helps when lifting a load that may slip.
5. It is recommended to ask for help when lifting a heavy load.
6. Strains should be avoided.
 - a. It is essential to bend the knees to get into position around the load.
 - b. It is best to grasp the load and to lift with the legs. Bending at the waist and lifting with the waist and stomach muscles should be avoided; legs are much stronger and less prone to injury.
 - c. The use of hand trucks, dollies, or any other assistive lifting or moving equipment helps avoid strains.
7. Carrying items that obstruct vision is not recommended.

E. Safe use of electrical equipment and machines

1. When assembling, disassembling, and cleaning, the item should be unplugged.
2. Plugs and cords should be checked periodically for breaks, tears, or frayed wiring.
3. It is important to make sure the unit is properly assembled before use.
4. The speed of the unit should be set to “off” or to a low setting before supplying power to the unit.
5. It is essential to don (put on) any required safety equipment for operation of the equipment or machinery (e.g., uniform, safety glasses, mesh gloves, hats and/or hair restraints, long-sleeve clothing).
6. Jewelry and fashion accessories (e.g., wrist bracelets, neck chains, long earrings, cords, and scarves around the neck) should be removed to avoid becoming entangled in the machinery or attachments.
7. The use of extension cords to operate electronic equipment and machinery should be avoided. Outlets designed to accept three-prong grounded plugs should be used.
8. Ground fault circuit interrupter (GFCI) outlets are required when electrical equipment will be used near water sources (e.g., sinks, water fountains, dishwashers, or garbage disposals). A **GFCI** is a special wall outlet that includes a built-in safety device to shut off the power in certain circumstances. For example, a blender falling into a full sink would trip the mechanism and cut the electricity.

- F. Slips, trips, and falls—Most slips, trips, and falls occur when students and/or workers are doing something other than paying attention to the immediate task and surroundings. The most common incidents occur when students/workers are

navigating steps, wet pavement, or wet floors and during ladder use. Advanced planning is the best prevention for these types of accidents. Suggested actions to correct the environment or to bring attention to the danger include:

1. Mopping up spills on floors immediately and posting “wet floor” signs around the area
2. Verbally warning students, workers, and customers of dangerous areas
3. Posting signs that alert students/workers/customers to dips in flooring or small step-downs from one flooring surface to another
4. Providing adequate lighting in all areas
5. Making frequent checks of outside areas (e.g., parking lots, walkways, or door entrances) where snow, ice, or fallen branches may obstruct clear pathways and correcting any additional safety hazards (e.g., potholes and large cracks)
6. Identifying **traffic patterns** (paths or areas that are intended to be particularly busy to foot traffic) with well-placed signage to prevent collisions between employees and between employees and customers (i.e., clearly mark doors between the kitchen and the dining area, one for “in” and one for “out”)
7. Making frequent checks and monitoring any worn or ripped carpet or rumpled rugs or runners
8. Providing handrails for all stairs
9. Keeping all walkways free from obstacles

G. Ladders and stools

1. Extension ladders extend to various lengths and then rest on the floor/ground and the wall/siding. Extension ladders should reach at least 3 feet above the area to be accessed. It is essential to ensure a safe angle for climbing. Use of the top two steps of an extension ladder is a safety risk.
2. Stepladders and stepstools should be tall enough to prevent the use of the top step. Reaching above one’s head, while on a stepladder or stepstool, should also be avoided. Selection of a different ladder is recommended when it would be necessary to use the top step or to reach above one’s head to complete the task.
3. Working with another person when using a ladder is recommended. The second person holds the ladder in place as the first person climbs up or down.
4. Ladders should be positioned on firm, dry, flat surfaces.
5. Folding stepstools and ladders should be opened, and the locking mechanism should be engaged before use.
6. Using metal ladders and stools near electrical boxes or equipment is dangerous and should be avoided.
7. Ladders should be positioned as close to the work site as possible. Positioning a ladder near obstacles (e.g., light fixtures or fans) is not safe.
8. The safety warning label on a ladder should be consulted to ensure that the combined weight of the person and the load is within safe limits. Exceeding the maximum weight specifications is not recommended.

H. Uniforms and protective garments

1. Compliance is required when jobs or tasks specify a uniform and/or protective garments and accessories (e.g., hard hats and safety glasses).
2. Guidelines for use of protective gloves, masks, hats, goggles, etc. must be followed.
3. Some jobs or tasks may require common sense to determine “safe apparel.” For example, while a chef may be required to wear a long-sleeve white coat, the fabric is generally not mandated. Clearly, the chef would not choose a highly flammable material based on his or her job duties, despite comfort or cost.

I. First aid

1. As prevention strategies may not always work, preparing for potential injuries is responsible and may prevent further harm. **First aid** consists of medical treatment given to a person at or near the injury site and is usually limited to light injuries or as a temporary fix until emergency services arrive.
 - a. First-aid kits should always be on hand and should be stocked with bandages, antiseptics, eye wash, scissors, and burn cream. Kits should also contain disposable latex gloves and face shields to protect against exposure to bodily fluids.
 - b. Training in basic first aid should include strategies to stop bleeding, treat heat and chemical burns, and deal with minor sprains and bumps.
2. Two techniques often used in concert with first aid are CPR and the Heimlich Maneuver. Both techniques save lives and require training. Being ready to treat an accident is the next best thing to prevention.
 - a. Cardiopulmonary resuscitation (**CPR**) is a physical action preformed on a person whose heart has stopped beating. Repeated pressure on the heart, coupled with forced breathing into the mouth and nose, may keep a person alive until medical personnel arrive. (Administration of CPR should be by someone who is trained and certified.)
 - b. Additionally, the **Heimlich Maneuver** is used worldwide as a way to clear the air passage of a choking victim (e.g., adults, children, or infants). According to the Heimlich Institute Web site, the process to assist a choking adult is as follows:
 - (1) From behind, it is necessary to place your arms around the choking person’s waist.
 - (2) Then make a fist and place the thumb side of your fist against the victim’s upper abdomen, below the rib cage and above the navel.
 - (3) Grasp your fist with your other hand, and press into the person’s upper abdomen with a quick, upward thrust. Do not squeeze the rib cage; confine the force of the thrust to your hands.
 - (4) Repeat until the object is expelled.

- J. Additional specific safety prevention information may be found in Occupational Safety and Health Administration (OSHA) resources. **OSHA** is an agency of the U.S. Department of Labor, and it mandates worker safety policies across the

country. Employers are obliged to provide and ensure job safety. Job-specific safety requirements are listed on the OSHA Web site. It is a requirement that all injuries to workers be reported to OSHA. Multiple worker injuries may indicate a problem that OSHA would investigate, and this often leads to revised safety regulations.

- K. Hair is a common source of workplace accidents. Hair should be kept short and/or restrained by hair nets (even under hats). Men with beards should wear beard nets, depending on the type of work being performed. Aside from safety, these precautions also meet standard sanitary codes.
- L. Running should be prohibited throughout the laboratory and workplace.

Discussion of this topic may include the use of VM–B, followed by student practice with LS–A and LS–B.

- **Review/Summary.** Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Questions at the ends of chapters in the textbook may also be used in the review/summary.
- **Application.** Use the included visual masters and lab sheets to apply the information presented in the lesson.
- **Evaluation.** Evaluation should focus on student achievement of the objectives for the lesson. Various techniques can be used, such as student performance on the application activities. A sample written test is provided.

■ **Answers to Sample Test:**

Part One: Multiple Choice

1. c
2. c
3. a
4. c
5. d
6. b
7. a
8. d
9. b

Part Two: True/False

1. F
2. F

3. F
4. T
5. F
6. T
7. T
8. F

Part Three: Completion

1. Corrosive
2. call the fire department
3. Heimlich Maneuver
4. first aid
5. let it fall to the floor
6. stepstool or stepladder
7. MSDS
8. Ansul systems

Follow Safety Procedures and Accident Prevention Techniques

► Part One: Multiple Choice

Instructions: Write the letter of the correct answer.

- _____ 1. The first step in using a fire extinguisher is to _____.
a. squeeze the trigger
b. shake the can
c. pull the safety pin
d. spray side to side
- _____ 2. Ladders should never be placed on _____.
a. flat surfaces
b. dry surfaces
c. wet surfaces
d. hard surfaces
- _____ 3. _____ would be typical protective items as part of a uniform.
a. Goggles, hard hats, and gloves
b. Lab coats, gloves, and rulers
c. Closed-toed shoes, hair nets, and spatulas
d. None of the above
- _____ 4. The fire extinguisher to select for an electrical fire is _____.
a. Class A
b. Class B
c. Class C
d. Class D



- ____ 5. The proper procedure for carrying a knife while walking is to ____.
- a. hold the handle and point the blade out in front of you
 - b. hold the blade and angle the handle upward
 - c. hold the handle with the blade flat across your chest
 - d. hold the handle with the blade facing down toward the floor
- ____ 6. The main safety risk to wearing necklaces or neck chains while using motorized equipment is that the necklace or chain could ____.
- a. fall into the machine and ruin the motor
 - b. become entangled in the machinery or attachment and pull you into the machine
 - c. act as a pathway for electricity, resulting in an electric shock
 - d. distract a co-worker and cause him or her to be injured accidentally
- ____ 7. A good practice when lifting boxes is to ____.
- a. check the weight of the load before lifting it
 - b. bend from the waist and lift by standing straight up
 - c. kick your shoelaces to the side so you don't trip on them
 - d. have another person nearby to help in case you get injured
- ____ 8. ____ would not prevent someone from tripping.
- a. Carrying boxes no higher than chin level
 - b. Bright lighting in hallways and stairways
 - c. A sign that says "caution, step down"
 - d. Shoveling several sidewalks after 4 inches of snowfall
- ____ 9. A meat packing plant that recorded 36 employee injuries in one month may expect an investigative visit from the ____.
- a. FDA
 - b. Occupational Safety and Health Administration
 - c. OMAH
 - d. MSDS

► Part Two: True/False

Instructions: Write T for true or F for false.

- ____ 1. Wet towels provide heat protection to hands when removing a hot pan from the oven.
- ____ 2. A Class B fire extinguisher is the best choice for dealing with a cardboard box fire.
- ____ 3. To store kitchen knives in drawers, all the handles must face the same direction.
- ____ 4. Disconnect the power cord before disassembling and cleaning a food processor.

- _____ 5. “Flip-flop” type sandals are acceptable in the workplace.
- _____ 6. Place safety signage at spills on tile floors.
- _____ 7. GFCI outlets provide electrical safety near water sources.
- _____ 8. Blenders, ovens, and toasters are considered small appliances.

► **Part Three: Completion**

Instructions: Provide the word or words to complete the following statements.

- 1. _____ chemicals may cause burns to the skin.
- 2. If a fire appears too large to handle with a fire extinguisher, you should _____.
- 3. A person choking on a chicken bone requires someone to perform the _____, a common procedure to open the airway.
- 4. Bandages, antiseptic, eye wash, and burn creams are typical _____ items to have on hand.
- 5. If a knife falls from the table, the best thing to do is to _____.
- 6. A(n) _____ should be tall enough so a person does not have to step on the top step.
- 7. In an effort to prevent chemical injuries, workers and employers should read the _____ and learn about the nature of the chemical with which they are working.
- 8. _____ are built into kitchen exhaust hoods over cooking equipment and are designed to quickly suppress fires.

POTENTIAL RISKS FOR INJURY IN THE LABORATORY AND IN THE WORKPLACE

- ◆ Cuts and punctures from blades and sharp objects
- ◆ Burns from heat sources or chemical agents
- ◆ Fire (grease, wiring, etc.)
- ◆ Sprains and strains due to improper lifting techniques
- ◆ Abrasions, broken bones, or electrocution caused by hand tools, electrical appliances, or machinery
- ◆ Long hair and loose clothing being caught in machinery
- ◆ Apparel accessories (jewelry, belts, scarves) being entangled in machinery and attachments
- ◆ Slips, trips, and falls (e.g., wet floors, rumpled rugs, ladders, or poor lighting)
- ◆ Running
- ◆ Refusing to wear required uniforms or protective equipment (e.g., gloves or goggles) required for the task



COMMON SAFETY PROCEDURES AND TECHNIQUES

Knife Safety

- ◆ Keep knives sharp.
- ◆ Attempting to catch a falling knife is dangerous.
- ◆ Wear safety gloves when using knives and other cutting blades.
- ◆ Store knives in proper knife racks.
- ◆ Carry and hand over knives properly.

Avoiding Burns

- ◆ Assume all pots and pans are hot; wear heat-resistant gloves or mitts when handling cookware.
- ◆ Chemicals may be corrosive or extremely acidic; wear disposable gloves while handling chemicals.



- ◆ Heed warning signs near open flames and heating equipment (e.g., ovens, stoves, or fryers).
- ◆ The wearing of open-toed shoes is prohibited when chemicals or hot foods are present.

Fire Safety

- ◆ Store chemicals properly.
- ◆ Tanks containing gas of any kind should be chained to the floor.
- ◆ Fire extinguishers should be properly charged and easily accessible.
- ◆ Ansul systems should be operational over cooking systems with open flames.
- ◆ Discard excess paper goods and clutter.
- ◆ Heat and smoke detectors must be installed and maintained in all laboratories and workplaces.
- ◆ Fire extinguishers are designed for the type of fire to be suppressed (e.g., paper, grease, or electrical). Train students and workers in the proper procedure for using a fire extinguisher.
- ◆ Know when to call the fire department.
- ◆ Exit and traffic paths must be kept clear.

Use Proper Lifting Techniques

- ◆ Check the weight of a load before lifting.
- ◆ Wear proper shoes and clothing.
- ◆ Bend and position yourself around the load.
- ◆ Balance the load before lifting.
- ◆ Lift with your legs.
- ◆ Do not obstruct vision when lifting and carrying.
- ◆ Ask for help when needed.

Using Hand Tools and Machines

- ◆ Wear the required uniform and protective equipment.
- ◆ Unplug units before cleaning and assembly.
- ◆ Power should be “off” before plugging in the unit.
- ◆ Avoid the use of extension cords.
- ◆ Avoid wearing jewelry and loose clothing, and avoid having long/unrestrained hair.
- ◆ Provide GFCI outlets for electrical equipment used near water sources.

Avoiding Trips, Falls, and Collisions

- ◆ Clean up and post signs around spills on the ground.
- ◆ Keep walkways clear of debris.
- ◆ Keep carpet and runners flat and in good repair.
- ◆ Post signs around uneven surfaces.
- ◆ Post signs for traffic-flow direction in busy areas.
- ◆ Provide handrails on all stairs.

Ladder Safety

- ◆ Select the proper height ladder or step stool for the job.
- ◆ Standing on the top step of a stool or the top two steps of a ladder is prohibited.
- ◆ Work in pairs when using ladders.
- ◆ Position stools and ladders on dry, hard, and flat surfaces.

Wrapping Up!

- ◆ Running in the laboratory or workplace is prohibited.
- ◆ Keep first-aid kits handy; know how to use the kit.
- ◆ The Heimlich Maneuver and CPR save lives.
- ◆ OSHA protects the rights of workers to have a safe and healthy workplace.

Identify Potential Safety Risks in the Classroom Laboratory and in the Workplace

Purpose

The purpose of this activity is to practice identifying and correcting potential safety risks in the classroom laboratory and workplace.

Objectives

1. Identify safety risks based on given situations.
2. Explain safety procedures to correct the identified safety risks.

Materials

- ◆ lab sheet
- ◆ writing utensil

Procedure

Read the following scenarios. Think about each scenario in “three dimensions.” In other words, look beyond the written description. Identify problems that, although not mentioned, are implied. Write a response describing the potential risk or risks you identified in the space provided.

For example: Jon set up his step stool in the lawn to clean out the gutters on the garage. While standing on the top step, he leaned to the right to remove a bunch of wet leaves and fell off the stool.



Noted risks: The step stool was too short. Jon should not have been standing on the top step. He should not have leaned over so far. And, clearly, the lawn was not a proper surface on which to set up a ladder or stool, especially if the ground is wet.

1. Trevor noticed that customer food orders were piling up in the kitchen, so he jumped into action. He ran from the preparation area to the sink and threw his cutting board and knives in the water to soak. Then he raced around the corner to help the line cooks.
2. It was raining heavily when the delivery truck arrived with the food order for the week. The driver and the boxes were going to get wet if the order was left on the loading dock, so the chef told the delivery driver to just leave the boxes piled up in the entrance hallway. She, the chef, would put them away later.
3. Steve went to the walk-in freezer to get a bag of french fries from the back shelf. He opened the door and noticed the interior light was burned out. Steve thought, "Well, I know just where they are kept" and proceeded into the freezer. The door closed behind him.

4. The main play area at Jackie's Day Care Center was being repainted while the children played on the opposite side of the room. Bill, the painter, was running short of paint thinner and bleach and advised the child care aide that he was going to his truck to get more supplies. The child care aide supervising the children said, "OK. I'll walk out and hold the door open for you."
5. Chef Angie was broiling 10 full slabs of ribs when a fire started in the broiler. She called the manager and then told the cooks to start covering food. Angie grabbed a fire extinguisher and sprayed the fire. The restaurant burned to the ground.
6. Stacy and Jim were finishing a conversation about how much they liked their loose, low-riding jeans when Mr. Turner came in the room and asked them to put the stock order away. Stacy and Jim went directly to the stock and started grabbing boxes and putting them away.

Identify Potential Safety Risks in the Classroom Laboratory and in the Workplace

Note: This activity could easily be conducted in groups or as an individual assignment, and the responses could be given orally rather than in writing. Answers may vary, but the potential risk or risks students should identify are shown below.

1. Noted risks: Trevor should not be running anywhere in the kitchen no matter how urgent the need. His knives should not have gone into the sink with the cutting board and should not have been “thrown.” By “speeding around the corner” to a busy cook line, Trevor could easily injure someone by bumping into them, particularly if they are holding hot pots, pans, plates, etc.
2. Noted risks: Piling boxes in a hallway effectively obstructs or blocks an intended exit path. Water may pool from the wet boxes, causing a potential risk for slips and falls.
3. Noted risks: Entering a room with insufficient or no lighting is a potential hazard. The fact that Steve entered a freezer suggests there may be ice or frost on the floor, making walking more dangerous. The door closing does not mean he was locked in. However, once the door closed, the room was likely devoid of all light, making his exit from the freezer even more treacherous.
4. Noted risks: Allowing children to inhale paint, paint thinner, and bleach fumes by remaining in a room that is being painted is potentially hazardous. The child care worker supervising the children left the room. The painter did not say he was out of paint thinner and bleach; he said he was “running short,” which means there was still some there. So technically children were left alone with access to caustic chemicals.
5. Noted risks: The sequence of events following the start of the fire is not in keeping with protocol. Angie’s first call should have been to the fire department rather than the manager. Secondly, directing the cooks to “cover the food” (theoretically to protect the food from the fire extinguisher discharge) was unnecessary. Thirdly, Angie grabbed a fire extinguisher and sprayed without noting if the class was designated for grease fires. The implication is that the class of extinguisher was not one designated for grease fires and the spraying may have actually exacerbated the fire danger. Moreover, it should be noted that a broiler fire should have been extinguished by an active Ansul system. It appears that the restaurant did not have an Ansul fire suppression system or the system malfunctioned.
6. Noted risks: Workers should not be wearing loose-fitting clothing on the job. By just “grabbing boxes,” Stacy and Jim put themselves at risk for injury. They should have noted the weight of the boxes, located a dolly, or worked as a team in moving boxes to protect the merchandise and themselves.

Case Study in Workplace Risk and Safety Procedures

Purpose

The purpose of this activity is to analyze a given situation with multiple elements of potential risk and to find appropriate solutions based on the lesson information.

Objectives

1. Identify safety risks in the workplace based on the given situations.
2. Explain the safety procedures to correct the workplace risks.

Materials

- ◆ lab sheet
- ◆ writing utensil

Procedure

The following “case study” (a written description of a real-life situation) is filled with problems. Work individually or in groups (as directed by your instructor). Read the case study, assess the situation, identify potential safety risks, and write recommendations or procedures that should be followed to eliminate or minimize the safety hazards you identified. Use complete sentences.

Case Study—Emerson High School

It is a cold and snowy January day at Emerson High School. Eight hundred students trekked into the building through the main entrance. The floor mats inside the doorway are soaking wet and rumpled from students stomping their feet to get snow off their shoes or boots.



The kitchen workers were late arriving at school due to the snow and are frantically preparing lunch for the first meal period at 10:30 a.m. Wanda is rushing to slice 40 pounds of ham on the electric meat slicer. Because time is short, she is also making chicken noodle soup on the stovetop. Feeling a bit pressured and frenzied, Wanda goes back and forth between the two tasks. She runs her fingers through her long hair, adjusts her necklace and glasses, sighs, and takes a moment to regroup her thoughts.

Meanwhile, two custodians are dealing with two tasks at opposite ends of the building. Curtis is changing the florescent lighting tubes in the 15-foot-high ceiling space at the entrance to the building. He set up a 12-foot step ladder and began the task. The other custodian, Mary, is in the basement welding two water pipes in which small leaks were discovered the day before. She rolled up her sleeves, lit the torch, and began welding.

In the nurse's office, an unusually large number of students are in need of treatment. Nurse Olson and her aide are both working to take care of the various student health needs, all of which are minor in nature. Suddenly, the door opens and Mr. Ruiz, the math teacher, brings in a student who has sustained a severe fall. The student, Don, is screaming in pain. Two teeth are missing, and he is bleeding profusely from his mouth. The aide immediately directs the young man to lie down and quickly shoves a wad of cotton in Don's mouth in the area of the missing teeth. Don starts to choke on blood that had run down his throat, and the aide is startled when she is sprayed in the face with droplets of blood. The aide now notices that Don is having difficulty breathing and that he has inhaled the wad of cotton.

Case Study in Workplace Risk and Safety Procedures

Note: This Lab Sheet may be an individual or a small group assignment, and the analysis may be presented orally rather than in written form. Answers may vary, but the potential risk or risks students should identify are shown below.

It is a cold and snowy January day at Emerson High School. Eight hundred students trekked into the building through the main entrance. The floor mats inside the doorway are soaking wet and rumpled from students stomping their feet to get snow off their shoes or boots.

Noted risks: "Wet floor" signs should be posted at the entrances, snow should be removed from steps and the entrance, and any water should be mopped up. Floor mats should be straightened and flattened of wrinkles. If possible, the wet mats should be replaced with dry mats. This problem may have been alleviated if the area outside the main entrance had been shoveled or plowed before school began.

The kitchen workers were late arriving at school due to the snow and are frantically preparing lunch for the first meal period at 10:30 a.m. Wanda is rushing to slice 40 pounds of ham on the electric meat slicer. Because time is short, she is also making chicken noodle soup on the stovetop. Feeling a bit pressured and frenzied, Wanda goes back and forth between the two tasks. She runs her fingers through her long hair, adjusts her necklace and glasses, sighs, and takes a moment to regroup her thoughts.

Noted risks: Pressure and time management are part of all jobs, and dealing with them well is the key to safety and success. Slicing meat on an electric slicer requires Wanda's complete attention. Distraction is not conducive to a safe workplace. More importantly, Wanda should have worn safety gloves for slicing, especially if she is distracted by other duties. Regardless of the task, she should not touch her hair while working with food. Long hair should be tied back and/or covered with a hair restraint or hat, and she should not wear a chain or necklace while working with food.

Meanwhile, two custodians are dealing with two tasks at opposite ends of the building. Curtis is changing the florescent lighting tubes in the 15-foot-high ceiling space at the entrance to the building. He set up a 12-foot step ladder and began the task. The other custodian, Mary, is in the basement welding two water pipes in which small leaks were discovered the day before. She rolled up her sleeves, lit the torch, and began welding.

Noted risks: The two custodians should work together; the work tasks would most likely be completed quicker and would be completed more safely. Curtis used a ladder that was too short, and he should not climb a ladder without a spotter. There is no evidence that Mary wore appropriate safety or protective clothing and equipment (e.g., gloves, a welding face shield, a hood, and a long-sleeve jacket). By rolling up her sleeves, Mary could easily get burned from sparks or burning debris.

In the nurse's office, an unusually large number of students are in need of treatment. Nurse Olson and her aide are both working to take care of the various student health needs, all of which are minor in nature. Suddenly, the door opens and Mr. Ruiz, the math teacher, brings in a student who has sustained a severe fall. The student, Don, is screaming in pain. Two teeth are missing, and he is bleeding profusely from his mouth. The aide immediately directs the young man to lie down and quickly shoves a wad of cotton in Don's mouth in the area of the missing teeth. Don starts to choke on blood that is running down his throat, and the aide is startled when she is sprayed in the face with droplets of blood. The aide now notices that Don is having difficulty breathing and has inhaled the wad of cotton.

Noted risks: Even though the nurse's office was busy, it was stated that most of the students needed only minor attention. On the other hand, Don had a serious fall in which he lost two teeth and was bleeding. Why did the aide, instead of the nurse, attend to this student? The nurse should have evaluated Don's injuries promptly and administered first aid. Then it may have been determined that paramedics should have been called to the scene. What was Don's teacher doing to assist the nurse and the aide? The teacher could have phoned for help and may have had time to phone the paramedics before entering the office. What happened to the teeth Don lost? The teeth should have been retrieved, wrapped in gauze, and kept for the doctor. Don should not have been asked to lie down flat with oral bleeding. Under the circumstances, the aide should have been wearing disposable latex gloves and a safety mask. A wad of cotton may or may not have been the best choice, but it should be removed immediately if choking occurs. With breathing being an issue as a result of the cotton, the Heimlich Maneuver may have been required, although the jarring nature of the Heimlich may have resulted in additional injury to the student. School personnel should have some level of first-aid training.