

Maintain Healthy, Safe and Secure Working Environment

INTRODUCTION

The work culture in IT industry is different from routine office work, where working hours are also not fixed. Continuously working in front of the computer creates health problems especially in your eyes. Adopting the safe work practice in the work place, the productivity can be increased.

This Unit deals with the concept of working environment in IT industry. It focuses on safe working practices at work place. It explains about health related problem caused by the wrong practices and it's solution. It also gives the knowledge about resources required in workplace for smooth working. Further it explains how to deal with computer component and problem related to electrical hazards. It also explains workplace safety guidelines, workplace hazard and it's control. The medical emergency situations and its solution is illustrated.

INTRODUCTION

One evening we were travelling on the busy road of Mumbai city. We were looking at the big and tall buildings. My friend was telling me that all these buildings hold different IT companies. Suddenly we find that there was a lot of smoke coming out of one building. People working in that building were running away from the building and shouting about the fire. Soon we find that the fire alarm was ringing and fire brigade vehicles along with water tanks were approaching the building. People were telling that there are lot of casualties and the overall damage to the building was worth of several lakhs. This event remind us the importance of health and safety at the workplace.



Fig.13.1: Illustration of fire catches in the office building

INTRODUCTION TO HEALTH, SAFETY AND SECURITY AT WORKPLACE

Every workplace accident, illness or dispute is a cost to organization, as well as a cost to injured individuals and their families. It is our responsibility to create a safe workplace. This will improve the work environment and the productivity. Employees have to take responsibility for their own health and safety rather than relying solely on the “safety officer” or management.

Health

Health of an employee is the state of the physical, mental and social well being. Every organisation must

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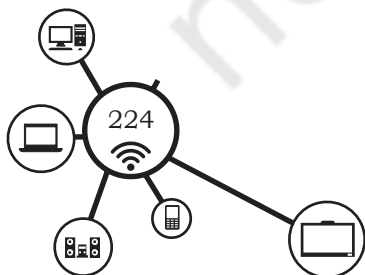
provide healthy and safety working environment for their employees at the workplace. Health of an employee must be in a good condition so that the employees of the organisation will not suffer from any diseases. Cleanliness at the workplace is mandatory. The work places must be cleaned in the morning before the people start working. If it is neat and clean then the people will feel happy to work in that environment. A proper air conditioning is mandatory to provide clean and cool air at workplace. A properly filtered water facility must be available for the employees of the company. A fresh food cafeteria must provide the good quality food for the employees. This will help to maintain the health of the employee. The organisation should maintain a clean washroom facility in good condition to be used by the employees.

Safety

The work environment of the organisation must be safe. It must be free from hazards and risk. A hazard is the something that can cause harm to the people. A risk is a probability of causing harm to the people. A proper safety guidelines must be prepared by the company and it should be strictly followed. At regular intervals of time, the safety procedures must be practised by employees.

Security

Every employee working in an organisation must feel that they are secured in the company campus. Security is a kind of freedom from any potential harm. Security ensures the safety of the people working in the organisation. Every organisation must have separate security department. This department should be responsible for various security such as personal safety, computer system safety, electrical safety, transport safety and other equipment safety. The proper security procedures will reduce liabilities, insurance and compensation for organisation. This will increase the business revenue and will reduce the operational charges of the company.



Policies and Procedures for Health, Safety and Security

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The Department of Information Technology (DoIT) has prepared the policy to provide employees with a healthy and safe work environment.

Definition

A health, safety and security policy is a written statement by an employer stating the company's commitment for the protection of the health, safety and security of employees and to the public. It is an endorsed commitment by management to its employees regarding their health, safety and security.

A health, safety and security program/policy contains the health, safety and security elements of an organisation and objectives which make it possible for the company to achieve its goal in the protection of its workers at the workplace.

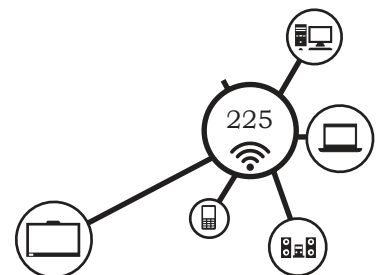
The government has a specific section mentioned in their company laws, which states the minimum requirements to be followed for health, safety and security programme. Each employer or company should follow these requirements. Apart from that the company should also have their own health, safety and security committee to determine the hazards present at the workplace. Once these hazards are identified then their control measures should be specified in the health, safety and security programme.

Reasons for Health, Safety and Security Programs or Policies in Workplace

There are several reasons that can be specified for safety policy as given below.

- It clearly indicates the company's commitment for their employee's health and safety;
- It shows the performance of the business and the safety performance are compatible with each other;
- It clearly state that the company is not only doing the business for profits but it is taking care of all its stake holders.

MAINTAIN HEALTHY, SAFE AND SECURE WORKING ENVIRONMENT



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- The accountability of every one working for the company is outlined for the workplace health, safety and security;
- Company can comply national policy on Occupational Health and Safety (OH&S) of Government of India;
- Injuries and illness of the employees is prevented through such policy

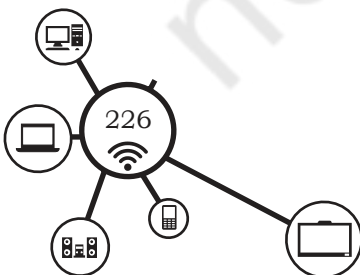
A typical policy of an IT company may contain the following OH&S clauses.

- Provide adequate resources to ensure continual improvement in its OH&S performance.
- Comply with relevant OH&S legal and other requirements applicable to the organisation and drive for 'beyond compliance' leadership.
- Set appropriate OH&S objectives & targets and conduct periodic performance reviews against these targets.
- Adopt measures and processes that focus on the prevention of occupation related accidents, injuries, illnesses, and near-misses and strive to continuously improve such processes.
- Ensure OH&S awareness and build competency associated at all levels to handle individual OH&S responsibilities.

Workplace Safety Hazards

The most common definition of hazard is '*a danger or risk*' that is associated with something. Something can even be considered a hazard if it would be a trigger for causing another hazard to become present, which could hurt someone or something in the area. Workplace hazards poses potential harm to people at work, and that can cause damage to the work environment and everything else in it. Hazards could cause adverse health effects and losses of property and equipment for organisations.

There is a common way to classify hazards, and not all these are present in all workplaces. In some industries like manufacturing and pharmaceuticals, there are biological and chemical risks that pose risks to the workers. Physical hazards are present as well in



many industries where there is exposure to electricity, radiation, extreme pressures, noises and magnetic fields. On the other hand, ergonomic hazards are present in facilities where there are repetitive movements and where workstations are set up haphazardly.

But it can be generalized that in all these classifications, there are always safety hazards that come up along with the highlighted workplace hazards.

Physical Hazards

It is the risks arising from the physical work environment – floors, facilities, walls, and ceilings. Physical hazards could also mean working with machinery and electricity-operated machines. Work processes or specific assignments could also qualify as areas where physical hazards are present. There is a vast list of physical hazards across all industries, but when we look at one specific sector, these hazards are also specific to the work setting.

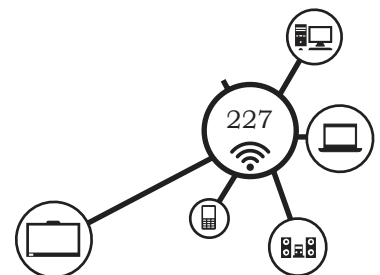
Falling Off Heights, Slipping and Tripping

The reasons for falling are attributed to faulty scaffolding and ladders, as a result of contact with electricity, and slipping or crashing into anything that throws the worker off balance (Fig. 13.2). On the other hand, trips and slips occur right on lower levels, particularly the floor, on ramps and any uneven surface in the workplace. Various injuries result from simply tripping over things at work, while many more accidents occur when employees slip on the floor, from motorized vehicles or from scaffolding or ladders.



Fig.13.2: Falling off height, slipping and tripping

To avoid falls and slips, all things must be arranged properly. Any spilt liquid, food or other items such as paints must be immediately cleaned to avoid any accidents. Make sure there is proper lighting and all damaged equipment, stairways and light fixtures are repaired immediately.



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Electrical Hazards

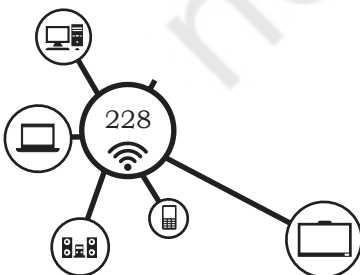
There are many reasons why workers get electrocuted or suffer from electric shock at work. For the most part, it's due to coming in direct contact with live wires, or having indirect contact through a conductor. While not all electrical accidents lead to death, there are many life-threatening, severe and often permanent injuries that could result from it. At work, the common causes of electrical accidents are exposed, worn-out wiring, overloading of electrical outlets, ungrounded or faulty equipment, and unsafe use of electrical equipment. Employees must be provided basic knowledge of using electrical equipment and common problems. Employees must also be provided instructions about electrical safety, such as keeping water and food items away from electrical equipment. Electrical technician and engineers should carry out routine inspections of all wiring to make sure there are no damaged or broken wires.

Fire Hazards

Each establishment must comply with housekeeping standards to ensure fire safety. Everyone not follows such requirements, and this leads to accidents resulting to fire. Such incidents not only damage the vital workplace equipment, stock and other items, and the building; it could also lead to injuries among its employees. To avoid fire, it is important to observe safety precautions at workplace. The whole organisation must also have first response and emergency mitigation systems in place. Employees should be aware of all emergency exits, including fire escape routes, of the office building and also the locations of fire extinguishers and alarms.

Health Hazards

Health refers to the physical well-being of the workers, and this includes the condition of their skin, eyes, ears and all other body parts. But it also includes the health situation of what we cannot see upfront – their respiratory and cardiovascular system, and the nervous system. Hazards are present in most workplaces that could



impact any part of the human body. For example, a noisy machine or factory environment could damage the sense of hearing of the workers. In the same manner, exposure to bright lights and toxic fumes and vapour could damage the eyes and nose. There are also more serious and long-term health issues arising from hazardous workplaces, such as damage to the lungs because of the exposure to harmful chemicals (Fig. 13.3).

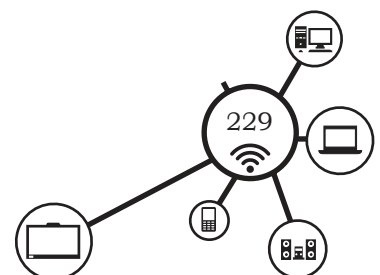


Fig.13.3: Health hazards

POTENTIAL SOURCES OF HAZARDS IN AN ORGANISATION

Bright light sources behind the display screen can create contrast problems, making it difficult to clearly see your work. Apply the following possible solutions to avoid this.

- Use blinds or drapes on windows to eliminate bright light. Blinds and furniture placement should be adjusted to allow light into the room, but not directly into your field of view.
- Use indirect or shielded lighting where possible and avoid intense or uneven lighting in your field of vision. Ensure that lamps have glare shields or shades to direct light away from your line of sight.
- Reorient the workstation so bright lights from open windows are at right angles with the computer screen.
- High contrast between light and dark areas of the computer screen, horizontal work surface, and surrounding areas can cause eye fatigue and headaches. So, use well-distributed diffuse light.



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Hazards using Computers

Hazards while using computers include poor sitting postures or excessive duration of sitting in one position. These hazards may result in pain and strain. Making the same movement repetitively can also cause muscle fatigue. In addition, glare from the computer screen can be harmful to the eyes. Stretching at regular intervals or doing some simple yoga in your seat can mitigate such hazards.

Handling Office Equipment

Improper handling of office equipment can result in injuries. For example, sharp-edged equipment if not handled properly, can cause cuts. Staff members should be trained to handle equipment properly. A relevant manual should be made available by the administration on handling equipment.

Handling Objects

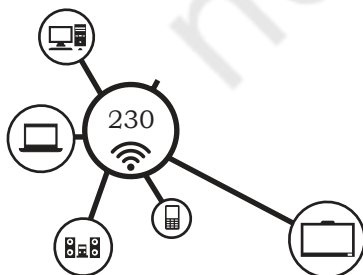
Lifting or moving heavy items without proper procedure or techniques can be a source of potential hazard. Always follow approved procedure and proper posture for lifting or moving objects.

Stress at Work

In organisations, you may encounter various stress-causing hazards. Long working hours can be stressful and so can aggressive conflicts or arguments with colleagues. Always look for ways for conflict resolution with colleagues. Have some relaxing hobbies for stress against long working hours.

Working Environment

Potential hazards may include poor ventilation, chairs and tables of inappropriate height, hard furniture, poor lighting, staff unaware of emergency procedures, or poor housekeeping. Hazards may also include physical or emotional intimidation, such as bullying or ganging up against someone. The staff should be made aware of organisation's policies to fight against all the given hazards related to a working environment.



Hazard Control

Hazards that have been identified and assessed as priorities require to implement adequate control measures. Control measures should follow the hierarchy with a strong emphasis on eliminating hazards at the source, whenever possible.

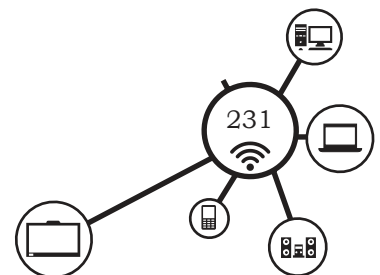
- Take all feasible measures to eliminate the hazard, for example, by substituting or modifying the process.
- If elimination is impractical or remains incomplete, take all feasible measures to isolate the hazard, for example, instituting engineering controls such as insulating noise.
- If it is totally impossible to eliminate or isolate the hazard, its likelihood to cause injury should be minimised. Ensure that effective control measures are being applied, such as installing proper exhaust ventilation and providing personal protective clothing and equipment that is properly used and maintained, and monitoring exposure among at-risk workers

Safety Guidelines Checklist

1. Store all cleaning chemicals in tightly closed containers in separate cupboards.
2. Throw garbage daily.
3. Make sure all areas have proper lighting.
4. Do not wear loose clothing or jewellery when working with machines.
5. Never distract the attention of people who are working near a fire or with some machinery, tools or equipment.
6. Where required, wear protective items, such as goggles, safety glasses, masks, gloves, and hair nets.
7. Shut down all machines before leaving for the workplace.
8. Do not play with electrical controls or switches.

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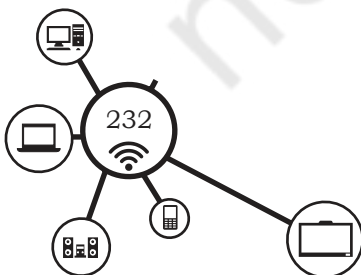
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9. Do not operate machines or equipment until you have been properly trained and allowed to do so by your supervisor.
10. Repair torn wires or broken plugs before using any electrical equipment.
11. Do not use equipment if it smokes, sparks or looks unsafe.
12. Cover all food with a lid, plastic wrap or aluminium foil.
13. Do not smoke in 'No Smoking' areas.
14. Report any unsafe condition or acts to your supervisor.

Check Your Progress

A. Multiple choice questions

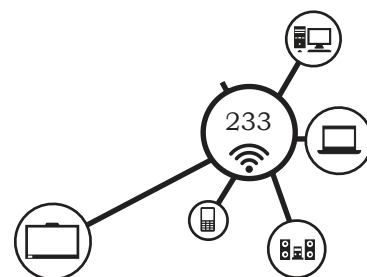
1. Workplace safety is essential in organisation _____.
(a) to avoid the accident and injury
(b) to increase the productivity
(c) to improve the work environment
(d) All of the above
2. Which of the following is not mandatory to keep the good health of an employee?
(a) Cleanliness
(b) Food court
(c) Clean and fresh air
(d) Clean washroom
3. The security department is not responsible for _____.
(a) personal safety
(b) computer system and equipment safety
(c) electrical safety
(d) personal belongings
4. The proper security procedures will increase _____.
(a) liabilities
(b) insurance
(c) business revenue
(d) operational charges of the company
5. Which kind of hazards can occur in IT industry?
(a) Biological
(b) Chemical
(c) Physical
(d) Ergonomic



6. Which of the following can cause hazards while using computers?
 - (a) Poor sitting postures or excessive duration of sitting in one position
 - (b) Lifting heavy object
 - (c) Mishandling of tools and equipment
 - (d) Improper handling of office equipment
7. Which of the following statements is likely to result in an injury to the operator?
 - (a) Selecting the right tool for the job
 - (b) Wearing safety goggles or glasses
 - (c) Using a tool with loose handles
 - (d) Keeping cutting tools sharp
8. What are the potential cause of hazards at workplace?
 - (a) Poor ventilation
 - (b) Poor lighting
 - (c) Poor housekeeping
 - (d) All of the above

B. Fill in the blanks

1. Health of an employee is the state of the physical, _____ and _____ well being.
2. The work places must be cleaned in the _____ before the people start working.
3. A proper _____ provide clean and cool air at the workplace.
4. A fresh food cafeteria helps to maintain the _____ of the employee.
5. The work environment of the organisation must be _____ and free from _____ and _____.
6. The proper security procedures will increase the _____ and will reduce the _____ of the company.
7. Injuries and illness of the employees is prevented through national policy on _____.
8. Physical hazards occurs due to _____.
9. Electrical hazards mostly caused due to coming in direct contact with _____, or indirect contact through a _____.
10. Hazards while using computers occurs due to _____ or excessive duration of sitting in _____.



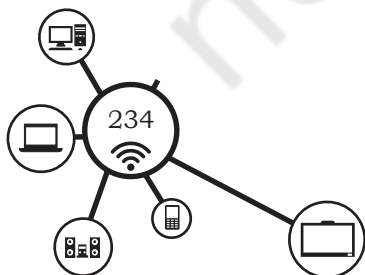
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C. State whether the following statements are True or False

1. The employer and employees are responsible for workplace safety.
2. Any injury at work should be reported to the supervisor immediately.
3. No matter how big or small the injury; the injured person should receive medical attention.
4. While working with machines and equipment, employees must follow the safety guidelines set by the company.
5. Bright light sources behind the display screen can create contrast problems.
6. Exposure to bright lights and toxic fumes and vapour could damage the mouth and ears.
7. The use of personal protective clothing and equipment can control the hazards at workplace.
8. Do not throw rubbish daily.
9. Proper handling of office equipment can result in injuries.
10. Stress at workplace can cause hazard in today's organisation.

D. Short answer questions

1. Briefly explain the concept of health, safety and security at workplace.
2. State the most important reasons for health, safety and security programs in workplace
3. List out the various workplace safety hazards.
4. List out the potential sources of hazards in an organisation.
5. List some of the IT workplace hazards.
6. What are the examples of potential hazards?
7. Describe information technology workplace hazards.
8. What are the workplace safety rules?
9. List out different safety guidelines?
10. Describe type of emergency with example.



CHAPTER 14 Workplace Quality Measures

INTRODUCTION

In any organisation it is necessary to maintain a good air quality to improve the working capabilities of employees. A pollution free air is an essential requirement for any organisation. Also most of the IT companies makes use of centralised air conditioning system to keep the temperature of working place at pleasant level. Water pollution is another problem faced by many organisations. Most of the human activities makes water polluted. The polluted water may cause the disease. So an organisation must ensure to prevent air pollution or water pollution.



Fig. 14.1: Air pollution and water pollution

AIR AND WATER QUALITY MONITORING PROCESS

Air and water pollution can be analysed by using several methods. There are three common forms of analysis – physical, chemical and biological. For such analysis samples can be collected in the surrounding region of the organisation.

The water and air samples can be analysed by performing some physical, chemical and biological tests.

The temperature and content of the sample can be easily measured. For example, the various gases or percentage of various gases, such as oxygen, nitrogen, carbon dioxide present in the air can be measured. The PH value of the water can be measured through chemical analysis. The effect of air and water on these

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plants and animals is studied. The microbial indicators are used to monitor the health of the ecosystem.

Guidelines for Clean Air and Clean Water

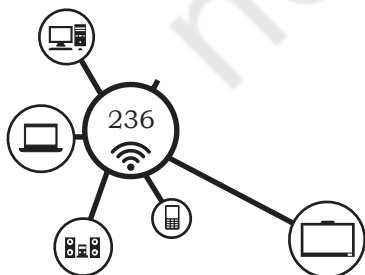
A proper guidelines may be followed by organisation to keep the surrounding air and water clean. Some of the points of such guidelines can be.

1. Air pollution is mostly caused by production of the dust, mixture of solid particles and gases in the surrounding air. So avoid dust production, generation of solid particles and gases in the air.
2. Extensive use of automobile vehicles in the campus can lead to the air pollution. So organisation must use limited number of vehicles to avoid air pollution. Practice a no vehicle day in every week.
3. Ozone produced in the air can pollute the air. Many times it is called as a smog. The generation of ozone gas must be kept at low level by the organisation.
4. Most of the human activities pollute the surrounding water. The sewage or the waste water can also cause the water pollution. Take care that their waste is not mixed with the surrounding water.
5. Extensive use of fertilizers and pesticide must be avoided as it can make the ground water polluted.

Importance of Cleanliness at Workplace

It is always safe to keep your workplace clean to avoid hazardous. The poor handling and storage practices result in damages. A clean work station makes your job easier and more pleasant. Common areas should be cleaned up by all personnel, when necessary.

- All areas must be kept neat and clean. Each employee is responsible for the cleanliness of their work area and all tools and equipment used.
- Spills and breakage are to be cleaned up immediately.
- Spaces around machines and equipment should be kept clear and clean at all times to permit free movement.



- Floors should be kept clean and clear to prevent slipping and collision.
- Lighting fixtures are to be checked regularly to permit clear vision. Faulty lights should be reported to administration, so that building maintenance/ facilities can be contacted to rectify the situation.

OFFICE ERGONOMICS

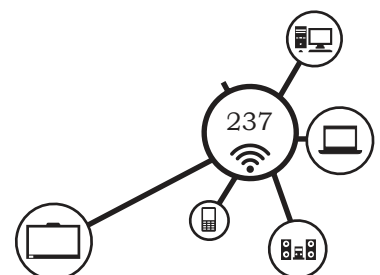
Ergonomics is the science concerned with designing and arranging things so that people can use them easily and safely. Applying ergonomics can reduce the potential for accidents, injury to improve performance and productivity. In an office setting, the repetition of a seemingly innocuous task over a period of time can cause an injury. The resulting injuries can be physically painful and rehabilitation can be difficult and time consuming. The following office ergonomics emphasize the identification of early warning signs.

Early Warning Signs	Potential Cause	Try This
Sore lower back	No lumbar support	Use back rest of chair, put small pillow or lumbar support on backrest of chair
Burning in the upper back	No upper back support from chair	Put document holder or prop up so you can see without leaning forward
Stiff neck	Working with head turned to side tilting head forward holding telephone between the ear and shoulder	Move or raise monitor to centre of desk check if headset is available
Sore shoulders	Reaching forward for long periods or reaching forward frequently	Move closer to the keyboard, Bring mouse down to level of keyboard or 1" higher
Arching wrists	Working with wrists extended too much repetition	Add a wrist rest to the front of keyboard and mouse pad rest thumbs on front edge of keyboard so wrists can't drop.
Dry eyes	Forget to blink	Rest eyes periodically and do simple eye exercises
Eye strain and sore eyes	Glares from overhead lights or windows eye glasses not correct need vision check	Re-orient your desk and computer so light is not directly behind or in front of you.

Computer Health and Safety Tips

With the increase use of computer, several health and safety issues related to vision, musculoskeletal issues,

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body aches and pains may occur. Many of these issues are preventable and if incurred are temporary. They can be resolved by adopting simple corrective action.

Musculoskeletal Problems

This problem include different areas of your body, such as neck, back, chests, arms shoulders and feet. It occurs because of your wrong posture, uncomfortable chair for sitting that is not ergonomically correct while working on the computer.

To avoid this problem,

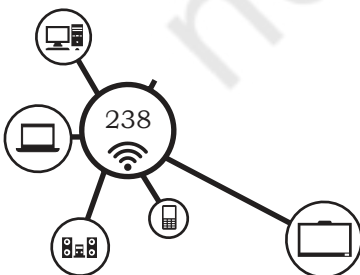
- Position your computer such that the end of the monitor should be at your eye level.
- Keep the neck neutral with monitor directly ahead to prevent to turn your neck.
- Keep your monitor at least arm length distance, or 20 to 30 inch away from you.
- Maximise contact of your back against the backrest of the chair.
- Adjust height of armrests so that your elbows are at a 100–110 degrees open angle.
- Place keyboard at a slight negative tilt if you are sitting upright.
- While typing, keep your hands slightly lower than elbows, with fingers pointing downwards at the floor.
- Minimise any twisting of your wrists from side to side or up and down.
- Use a keyboard palm rest as needed only when you are not typing. Do not rest your wrists when typing. It leads to wrist strain.
- Always take small breaks while working on the computer to stretch your muscles, keep your blood flowing, and to rest your eyes.



Fig. 14.2: Ideal Neck and Monitor position

Occupational Overuse Syndrome

Occupational overuse syndrome, also known as repetition strain injury (RSI), is a collective term for a range of conditions, characterised by discomfort or persistent pain in muscles, tendons and other soft tissues, with or without physical manifestations. It is



usually caused or aggravated by work, and is associated with repetitive movement, sustained or constrained postures and/or forceful movements. Psycho-social factors, including stress in the working environment, may be important in the development of occupational overuse syndrome.

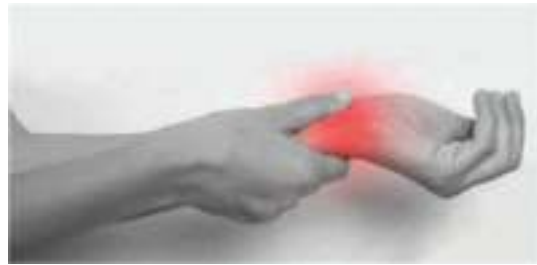


Fig. 14.3: Symptoms of carpal tunnel syndrome

Repetitive use of muscle may feel pain in your neck, shoulder, wrist or fingers. One of the most common conditions related to repetitive use of muscles when using the computer is carpal tunnel syndrome. It causes pain, numbness, and tingling in the hand and arm as shown in Fig. 14.3.

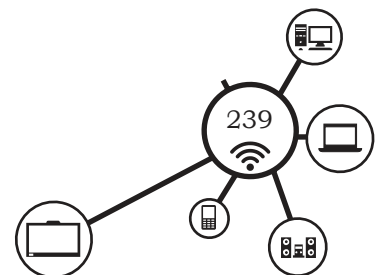
Ensure that you use appropriate posture when typing. For example, your fingers should be above the 'home position' (*asdf* and *jkl;* keys) on the keyboard, when your elbows are by your sides. Users should avoid gripping the mouse too tightly. The keyboard and mouse should be kept at the same level. In addition, use of ergonomic keyboard and mouse help to reduce the risk of wrist related conditions.

Strain in Legs and Feet

Sitting to work for long time may cause strain in legs. Position your desk chair to sit comfortably with your feet flat on the floor and your lower legs vertical. Use a footrest for more support. Make sure that there's enough space to change position and stretch your legs out every now and then, too.

Eye Strain

Computer's bright light, glare and flickering images can cause eye strain and visual fatigue. When you constantly focus on screen, you forget about blinking your eyes that can cause of drying eyes. Computer Vision Syndrome is caused by poor lighting and glare on the computer screen. Both of these factors place strain on the users eyes, causes blurry vision, burning and/or watering eyes, headaches and in some instances shoulder and neck pain. It is important to look after your eye health. Specifically wear anti-glare glasses to work on computer.



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To reduce the risks of visual problems:

- Adjust the brightness of computer screen to save your eyes from strain.
- Reposition the screen to avoid glare from lights or windows.
- Keep a proper vision distance from computer screen and blink your eyes in an interval.
- Wear anti-glare glasses while working in computer.
- Keep the screen clean and use a desk lamp to make it easier to see.
- Ensure the screen colours are easy to look at, and that the characters are sharp and legible.
- Give your eyes periodic breaks from the screen and perform frequent blinking. Look away from the screen into the distance for a few moments to relax your eyes; focus on something 30 metres away for 30 seconds every 30 minutes.
- Keep your monitor between 18 to 24 inches away from your face. Lastly, position monitors to avoid glare from sunlight and keep them clean.

Headaches

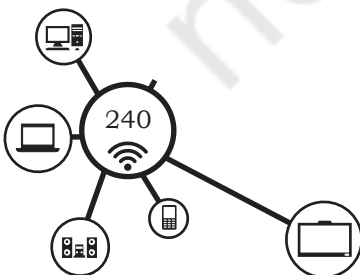
Headache may occur due to muscle tension or pain in the neck. Strain on the eyes or vision problem can also cause headaches. Attend regular eye exams to work toward correcting any vision problems. Try your best to keep your neck straight in front of the computer and take breaks.

Obesity

Spending long hours on computers may lead lacks of physical activity and exercise. In children prolonged use of computers or electronics in general, is a major contributing factor to obesity. You should take a break and try to squeeze in some exercise until you go back to work.

Stress Disorders

Technology impacts our behaviors and emotions. Prolonged use of computers may be accompanied by poor health and increased pressure on you in your workplace, which may lead to stress. The longer the



stress untreated, the greater the chances of contracting more serious health problems. Stress can lead to decreased attention span, lack of concentration, dizziness and becoming easily burned out. To tackle this problem, promote your own health and prevent future health conditions or by seeking treatment options for any stress that you may encounter. Try things from yoga, to natural remedies, to medications as prescribed by a medical provider to combat your stress.

Injuries from Laptop Use

The growing use of laptops cause more pain and strain. Laptops are designed for short periods of use. In present day individuals choose to use laptops over desktops more frequently, due to convenience. In laptop the screen and keyboard are very close together and there is really no right way to use a laptop because if you position the screen at the right height for your back and neck, it will cause you to have to lift your arms and shoulders too high to use it and vice versa. It will probably cause a problem. To overcome this problem, you may use desktop that is set up ergonomically-correct, while working for long hours.

Sleeping Problems

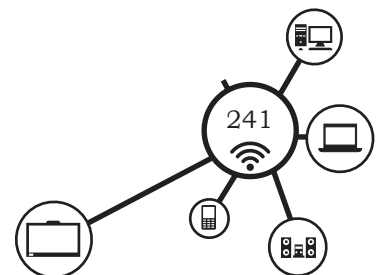
Artificial lighting from computer screens can trick your brain and suppress its release of melatonin substance that assists your sleeping patterns. To tackle this, refrain from using a computer right before going to bed.

Health and Safety Requirements for Computer Workplace

The minimum health and safety requirements for computers including Desktop computers, Laptops, Tablets, Smart phones, Television screens and Video monitors are as follows:

Display Screen (Monitor)

Use the modern LED monitors of legible size and with adequate spacing between the characters and lines. The image on the screen should be stable, with no flickering or other forms of instability. The screen must be free of



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reflective glare and reflections liable to cause discomfort to the user.

Keyboard

The keyboard should tilt and separate from the screen to find a comfortable working position and avoid fatigue in the arms or hands. The space in front of the keyboard must be sufficient to provide support for the hands and arms of the user. The keyboard should have a matt surface to avoid reflective glare. The symbols on the keys must be adequately contrasted and legible from the design working position.

Work Surface

The work desk should be sufficiently large, low-reflectance surface and allow a flexible arrangement of the screen, keyboard, documents and related equipment. The document holder shall be stable and adjustable so as to minimise the need for uncomfortable head and eye movements.

Work Chair

The work chair must be stable and allow the user to move easily and find a comfortable position. It should be adjustable in height. The user's feet must be placed flat on the floor or a footrest should be used.

Space Requirements

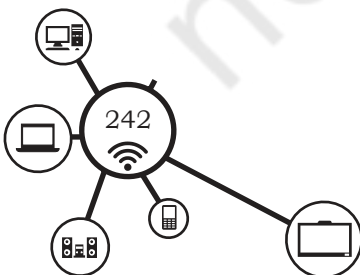
The workstation should be designed to provide sufficient space for the user to change position and vary movements. The user should have enough desk space for the equipment they use.

Lighting

There must be satisfactory lighting conditions with appropriate contrast between the screen and background environment. Possible disturbing glare and reflections on the screen or other equipment should be prevented.

Reflections and Glare

Workstations should be designed so that sources of light, such as windows and other openings, transparent



or translucent walls, and brightly coloured fixtures or walls cause no direct glare and no distracting reflections on the screen. Windows shall be fitted with a suitable system of adjustable covering to attenuate the daylight that falls on the workstation.

Noise and Heat

Noise emitted by equipment should not distract the attention. Noise cancelling earphones may provide a solution if some noise is unavoidable. The equipment may not produce excess heat which could cause discomfort to users.

Cautions while Working on the Computer

It is important to work safely on computer. The static electricity generated just by walking on the carpet can damage your computer component. So use a surge protector when you plug your system in.

A battery backup system is the best way to protect against a power outage, as it provides the system with constant voltage.

Remove rings, watches and necklaces while working on the computer. These ornaments are often made of conductive metals which can damage Computer components by striking them static electricity.

Unplug all power sources and cables from computer. If you are working with plugged in computer then it might damage your hardware. Modern processors will overheat within 7 sec if heat sink is not attached.

Watch Out for Cords and Wires

Loose cords and wires can cause hazard and even electrical hazards as shown in Fig. 14.5.

If a cord or wire will cross a pathway safety it should be mark it with hazard tape as shown in Fig. 14.6.



Fig. 14.6: Hazard tape



Fig. 14.4: Unplug power source from computer



Fig. 14.5: Loose cord that can be hazardous

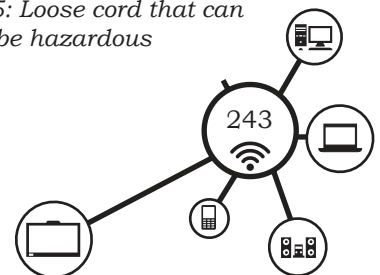




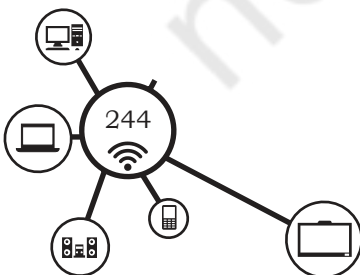
Fig. 14.7: Avoid water while working with electricity

Avoid water at all times when working with electricity. Never touch or try repairing any electrical equipment or circuits with wet hands. It increases the electrical conductivity of the body for the flow of electric currents.

Check Your Progress

A. Multiple choice questions

- To provide healthy and safety working environment, every organisation must have _____.
 - Cleanliness
 - Filtered water
 - Clean wash-room
 - All of the above
- Air pollution is mostly caused by production of the _____ in the surrounding air.
 - dust
 - mixture of solid particles
 - gases
 - All of above
- Repetitive use of muscle may feel pain in your _____.
 - neck
 - shoulder
 - wrist or fingers
 - All of the above
- The security department organisation is not responsible for _____.
 - other safety
 - computer system safety
 - electrical safety
 - transport safety
- For an organisation, the proper security procedures will reduce _____.
 - liabilities
 - insurance
 - business revenue
 - operational charges of the company
- Do not wear _____ when working with machines.
 - jewellery
 - safety glasses
 - masks
 - gloves
- Sore lower back is caused due to _____.
 - reaching forward frequently
 - no lumbar support
 - no upper back support from chair
 - reaching forward for long periods



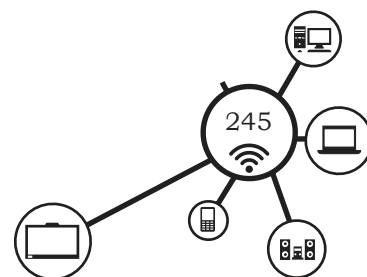
8. What should you do with the problem of dry eyes?
 - (a) Forget to blink
 - (b) Rest eyes periodically and do simple eye exercises
 - (c) Do exercise
 - (d) Blink the eyes
9. If light is coming directly behind or in front of you then you may suffer from _____.
 - (a) eye strain
 - (b) sore eyes
 - (c) dry eyes
 - (d) eye strain and sore eyes

B. Fill in the blanks

1. Air and water pollution can be analysed by using – physical, _____ and _____ analysis.
2. The PH value of the water can be measured through _____ analysis.
3. The _____ indicators are used to monitor the health of the ecosystem.
4. Ergonomics is the science concerned with _____ and arranging things.
5. Working with wrists extended too much repetition can cause _____.
6. The repetition of a seemingly _____ task over a period of time can cause an injury.
7. If a cord or wire will cross a pathway safety it should be mark it with _____.
8. Loose cords and wires can cause _____.
9. Glare and _____ on the screen should be prevented.
10. The keyboard should have a matt surface to avoid _____ glare.

C. State whether the following statements are True or False

1. The work environment of the organisation must be free from hazards and risk.
2. Practice a no vehicle day in every week to avoid air pollution.
3. Applying ergonomics can improve performance and productivity.
4. Wear rings, watches and necklaces while working on the computer.
5. Never touch or try repairing any electrical equipment or circuits with wet hands.
6. Unplug all power sources and cables from computer while working on computer.

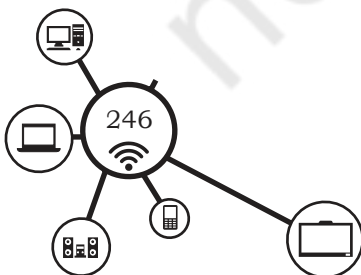


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7. Occupational overuse syndrome, also known as repetition strain injury.
8. The work chair must be stable and allow the user to move easily.
9. Artificial lighting from computer screens can cause sleeping problems.
10. The keyboard and mouse should not be kept at the same level.

D. Short answer type questions

1. What causes the water pollution?
2. What is occupational overuse syndrome?
3. What are musculoskeletal problems?
4. What cautions to be taken while working on the computer?
5. Why there is no right way to use a laptop?
6. What causes eye strain and how to avoid it?
7. What type of display screen is suitable to work on computer?
8. What type of keyboard is suitable to work on computer?



INTRODUCTION

In an organisation, any small accident or unforeseen situation may turn into emergencies if not given due attention. The emergencies can be natural, such as floods, hurricanes, earthquakes or man-made emergencies may include fire, toxic gas releases, chemical spills, illness, explosions, and civil disturbances. Such situations may disrupt or shut down your operations, or may cause physical or environmental damage. While no one expects such emergencies and disasters that can strike anyone, anytime, anywhere. The best way to protect yourself and your organisation is to develop a well thought-out emergency action plan to guide the employees in the event of an emergency. This chapter explains the general workplace hazards, its prevention, care and how to keep workplace safe.

ACCIDENTS AND EMERGENCIES

An accident is an unplanned, uncontrolled, or unforeseen event resulting in injury or harm to people and damages to goods. For example, a person falling down and getting injured or a glassware item that broke upon being knocked over. Emergency is a serious or crisis situation that needs immediate attention and action. For example, a customer having a heart attack or sudden outbreak of fire in your organisation needs immediate attention.

Each organisation has procedures and practices to handle and report accidents and to take care of emergencies. Although most of these procedures and practices common across the industry, some

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procedures might be modified to fit a particular type of business within the industry. For example, procedure to handle accidents caused by slipping or falling will be similar across the industry. You need to be aware of the general procedures and practices as well as specific to your organisation.

The following are some of the guidelines for identifying and reporting an accident or emergency:

Notice and Correctly Identify Accidents and Emergencies

You need to be aware of what constitutes an emergency and what constitutes an accident in an organisation. The organisation's policies and guidelines will be the best guide in this matter. You should be able to identify such incidents in your organization, and be aware of the procedures to tackle each form of accident and emergency.

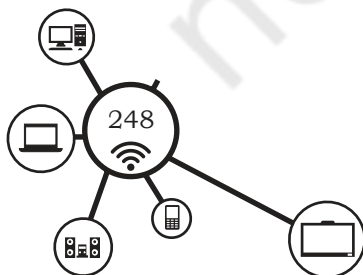
Get help Promptly and in the Most Suitable Way

Follow the procedure for handling a particular type of accident and emergency. Promptly act as per the guidelines. Ensure that you provide the required help and support as laid down in the policies. Do not act outside the guidelines and policies laid down for your role even if your actions are motivated by the best intention.

Remember that only properly trained and certified professionals may be authorized to take decisions beyond the organisation's policies and guidelines, if the situation requires.

Follow Company Policies and Procedures for Preventing Further Injury While Waiting for Help to Arrive

If someone is injured, do not act as per your impulse or gut feeling. Go as per the procedures laid down by your organisation's policy for tackling injuries. You need to stay calm and follow the prescribed procedures.



Act within the Limits of your Responsibility and Authority when Accidents and Emergencies Arise

Provide help and support within authorised limit. Provide medical help to the injured only if you are certified to provide the necessary aid. Otherwise, wait for the professionals to arrive and give necessary help.

Promptly Follow Instructions given by Senior Staff and the Emergency Services

Provide necessary services as described by the organisation's policy for your role. Also, follow the instructions of senior staff who are trained to handle particular situations. Work under their supervision when handling accidents and emergencies.

Types of Accidents

The following are some of commonly occurring accidents in organisations:

Trip and Fall

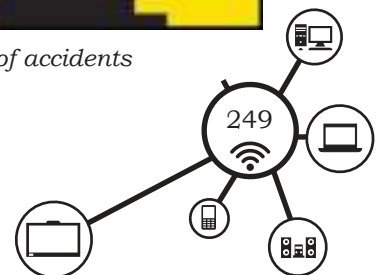
Customers or employees can trip on carelessly left loose material and fall down, such as tripping on loose wires, goods left on aisles, elevated threshold. This type of accident may result in simple bruises to serious fractures.

Slip and Fall

slips are mainly due to wet floors, spilling of liquids or throwing of other slip-causing material on floors. Slip and fall is generally caused by negligence. It can also be due to broken or uneven walking surface, such as broken or loose floor tile. People should be properly cautioned against tripping and slipping. For example, a “wet floor” sign will warn people to walk carefully on freshly mopped floors. Similarly, “watch your steps” signs can prevent accidents on a staircase with a sharp bent or warn against a loose floor tile.



Fig. 15.1: Types of accidents



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Injuries caused due to Escalators or Elevators (or lifts)

Although such injuries are uncommon, they mainly happen to children, ladies, and elderly. Injuries can be caused by falling on escalators and getting hurt. People may be injured in elevators by falling down due to sudden, jerking movement of elevators or by tripping on elevators' threshold. They may also get stuck in elevators resulting in panic and trauma. Escalators and elevators should be checked regularly for proper and safe functioning by the right person or department. If you notice any sign of malfunctioning of escalators or elevators, immediately inform the right people. If organization's procedures are not being followed properly for checking and maintaining these, escalate to appropriate authorities in the organization.

Accidents due to Falling of Goods

Goods can fall on people from shelves or wall hangings and injure them. This typically happens if pieces of goods have been piled improperly or kept in an inappropriate manner. Always check that pieces of goods are placed properly and securely.

Accidents due to Moving Objects

Moving objects, such as trolleys, can also injure people in the organisation. In addition, improperly kept props and lighting fixtures can result in accidents. For example, nails coming out dangerously from props can cause cuts. Loosely plugged in lighting fixtures can result in electric shocks.

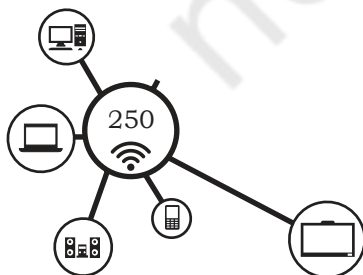
Handling Accidents

Try to avoid accidents in your organization by finding out all potential hazards and eliminating them. In case of an injury to a colleague due to an accident, do the following.

Attend to the Injured Person Immediately

Depending on the level and seriousness of the injury, see that the injured person receives first aid or medical help at the earliest.

DOMESTIC DATA ENTRY OPERATOR – CLASS X



Inform your Supervisor

Give details about the probable cause of accident and a description of the injury.

Assist your Supervisor

Investigate and find out the actual cause of the accident. Help your supervisor to take appropriate actions to prevent occurrences of similar accidents in future.

Types of Emergencies

It is important to have policies and procedures to tackle the given categories of emergencies. You should be aware of at least the basic procedures to handle emergencies. Here are some general emergency handling procedures that you can follow:

First Aid

Should be quickly accessible to the employees. It should contain all the important items for first aid required to deal with common problems such as cuts, burns, headaches and muscle cramps.

Electrical Safety

Employees must be provided instructions about electrical safety such as keeping water and food items away from electrical equipment. Electrical staff and engineers should carry out routine inspections of all wiring to make sure there are no damaged or broken wires.

Keep a list of numbers to call during emergency, such as those of police, fire brigade, security, ambulance etc.

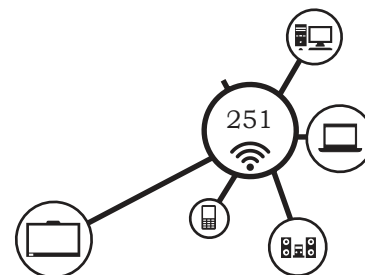
Regularly check that all emergency handling equipment such as the fire extinguisher and fire alarm system are in working condition.

Ensure that emergency exits are not obstructed and keys to such exists are easily accessible. Never place any objects near the emergency doors or windows

Evacuation

It is critical for employee to know who is the coordinator or authority to make decisions during emergencies.

MAINTAIN HEALTHY, SAFE AND SECURE WORKING ENVIRONMENT



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The coordinator should be responsible to handle evacuation process.

General Evacuation Procedures

Each organization has its own evacuation procedures as listed in its policies. You should be aware of these procedures and follow them properly during an emergency evacuation. In addition to organization's policies, here are some general evacuation steps useful in such situations,

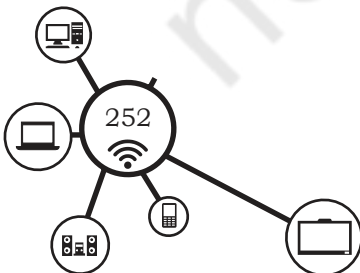
- Leave the premises immediately and start moving towards the nearest emergency exit.
- Guide your customers to the emergency exits.
- If possible, assist the person with disability to move towards the emergency exit.
- You may carry your hand-held belongings, as you move towards the emergency exit. Do not come back to pick up your belongings unless the area is declared safe.
- Do not use the escalators or elevators (lifts) to avoid overcrowding and getting trapped, in case there is a power failure. Use the stairs instead.
- Go to the emergency assembly area. Check if any of your colleagues are missing and immediately inform the person concerned.

Fire Hazards in the Workplace

The first step to fire safety is assessing the existence of fire hazards in workplace. In most facilities, there are three main types of hazards to evaluate – electrical hazards, combustible materials, and flammable materials.

Electrical issues, such as damaged extension cords, blocked electrical panels and heaters, and overloaded circuits often lead to fires. Fires are also commonly caused by electrical events such as arc flash. Maintenance of power cords and other electrical equipment should be conducted on a regular basis.

Workplace fires are also commonly caused by improper storage of flammable material or combustible dust. Both are dangerous and should be properly



handled and stored. Dust explosions can be another cause of fire hazard.

Fire Prevention

- All employees must know where the fire extinguishers are located, and how to properly use them.
- Fire extinguishers and First Aid Stations should be clearly marked with signs.
- Never block access to Exits, fire extinguishers, electric switches and panels.
- Do not block or stack material against doors, which would prevent them from operating properly in event of a fire.
- Do not use flammable material near electrical panels, switches, lift trucks or any electrical equipment.
- Make sure all equipment is properly grounded where needed.
- Fire extinguishers must be inspected regularly.
- Report to your supervisor of any defect in electrical, fire prevention or material handling equipment.
- No flammable material are to be placed around an exit door way.

Identification of Material and Ignition Sources

Materials are classified by risk, and are sorted according to these fire classifications:

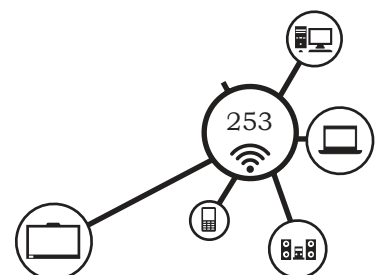
Class A Material: materials such as wood, cloth, and paper, which won't ignite on their own but will continue to burn once exposed to a heat source.

Class B Material: all liquid, grease, and gas materials that burn when exposed to ignition sources.

Class C Material: electrical materials and equipment. These materials cause fires very quickly and present a serious risk of arc flash.

Class D Material: any materials that are volatile and able to quickly ignite, such as magnesium, potassium, and sodium.

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Examples of ignition sources include:

Open flames such as gas ovens, lighters in smoking areas, and welding torches.

Sparks from wood or metal saws and other types of equipment.

Heat sources such as combustion engines, space heaters, ovens, and machines that produce heat during operation.

Chemical ignition from chemicals that combust under normal working temperatures.

Select the suitable type of fire extinguisher					
	Water CO2	Dry chemical powder	Carbon dioxide	Mechanical foam	ABC dry powder
Class A	Suitable	Not suitable	Not suitable	Suitable	Suitable
Class B	Not suitable	Suitable	Suitable	Suitable	Suitable
Class C	Not suitable	Suitable	Suitable	Not suitable	Suitable
Class D	Not suitable	Suitable	Not suitable	Not suitable	Suitable



Fig. 15.2: Fire extinguisher with its parts labeled

Fire Extinguisher

A fire extinguisher is a protection device used to extinguish fires. It is a cylindrical pressure vessel containing an agent which can be discharged to extinguish a fire. The Fig. 15.2 shows the different parts of fire extinguisher.

The following activity will demonstrate the operation of fire extinguisher.

Practical Exercises

Demonstrate the operation of a fire extinguisher.

Procedure

Step 1: Identify the safety pin of the fire extinguisher, present in its handle.

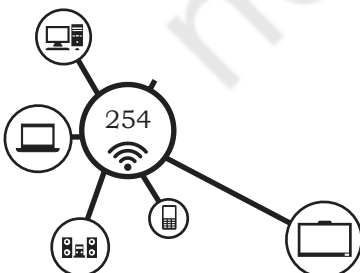
Step 2: Break the seal and pull the safety pin from the handle.

Step 3: Use the fire extinguisher by squeezing the lever.

Step 4: Sweep it from side to side.



Fig. 15.3: Steps to open the seal and safety pin



First Aid for Electrical Emergencies

Electrical accidents cause countless injuries. Injury could be minimised and many lives can be saved if proper rescue techniques and treatment are used. Electrical accidents may occur at any time or place. Timely response and treatment of victims is a major concern. When an electrical accident occurs, due to the effect of muscle cramping, a victim is often incapable of moving or releasing the electrical conductor. There should always be an emergency response plan for scheduled electrical maintenance or work.



Fig. 15.4: An unconscious state because of an electrical shock

Electrical Rescue Techniques

Approaching the accident

- Never rush into an accident situation.
- Call 108 as soon as possible.
- Approach the accident place cautiously.

Examining the scene

- Visually examine victims to determine if they are in contact with energised conductors.
- Metal surfaces, objects near the victim itself may be energised.
- Do not touch the victim or conductive surfaces while they are energised.
- Switch off the electrical circuits if possible.

Hazards and solutions

- Be alert for hazards, such as heated surfaces and fire.
- In case you cannot switch off the power source, take extreme care.
- Ensure that your hands and feet are dry.
- Wear protective equipment, such as gloves and shoes. Stand on a clean dry surface.
- Use non-conductive material to remove a victim from the conductor.

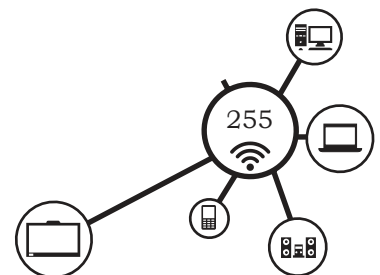




Fig. 15.5: Beware of high voltage

High voltage rescue

- Special training is required for rescues if high voltage is present.
- Protective equipment, such as gloves and shoes must be worn.



Fig. 15.6: Gloves and shoes for safety

First Aid

- A victim may require Cardio-Pulmonary Resuscitation (CPR). Steps to perform in CPR are shown in the Fig. 15.6 and 15.7.



Fig. 15.7: Open the mouth for airway

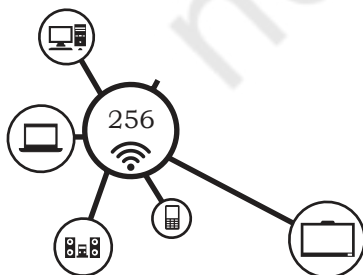


Fig. 15.8: Rescue breathing

- If the victim is breathing and has a heartbeat, give first aid for injuries and treat for shock.
- Ensure the victim gets medical care as soon as possible.
- Physician attending the victim must have detailed information to properly diagnose and care for the victim.

Practical Exercises

Identify and name the steps mentioned in the following figures.



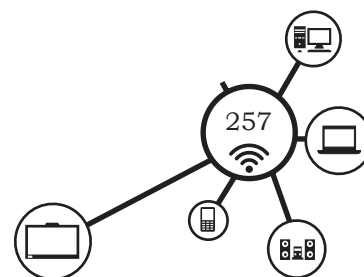
Check Your Progress

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A. Multiple choice questions

1. What are the steps necessary for operating a fire extinguisher?
 - (a) Identify the safety pin of the fire extinguisher which is generally present in its handle
 - (b) Break the seal and pull the safety pin from the handle
 - (c) Use the fire extinguisher by squeezing the lever
 - (d) All of the above
2. Which of the following is an examples of ignition sources of open flames?
 - (a) Gas ovens
 - (b) Lighters in smoking areas
 - (c) Welding torches
 - (d) All of the above
3. In fire classification, all liquid, grease, and gas material comes under _____.
 - (a) Class A material
 - (b) Class B material
 - (c) Class C material
 - (d) Class A material
4. In fire classification, material magnesium, potassium, and sodium comes under _____.
 - (a) Class A material
 - (b) Class B material
 - (c) Class C material
 - (d) Class D material
5. In fire classification, material wood, cloth, and paper comes under _____.
 - (a) Class A material
 - (b) Class B material
 - (c) Class C material
 - (d) Class D material
6. In fire classification, electrical material and equipment comes under _____.
 - (a) Class A material
 - (b) Class B material
 - (c) Class C material
 - (d) Class D material
7. When do we use a fire extinguisher?
 - (a) In case of flood
 - (b) In case of electric shock
 - (c) In case of fire
 - (d) In case of burn injury
8. What is the primary fire emergency telephone number is?
 - (a) 011
 - (b) 101
 - (c) 108
 - (d) 111

MAINTAIN HEALTHY, SAFE AND SECURE WORKING ENVIRONMENT



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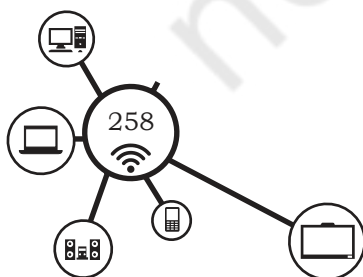
9. Which of the following contains everything you need to know about evacuating your facility safely?
 - (a) Evacuation Diagram
 - (b) Emergency Action Plan
 - (c) Employee Directory
 - (d) Both (a) and (b)
10. The best course of action to take during a medical emergency is to _____.
 - (a) Begin first aid immediately
 - (b) Activate the emergency plan for reporting injuries
 - (c) Notify the person's family about the situation
 - (d) Both (a) and (b)

B. Fill in the blanks

1. Emergency is a serious or crisis situation that needs _____ attention and _____.
2. A _____ sign will warn people to walk carefully on freshly mopped floors.
3. _____ signs can prevent accidents on a staircase with a sharp bent or warn against a loose floor tile.
4. The _____ should be responsible to handle evacuation process.
5. Workplace fires are commonly caused by improper storage of _____ material or _____ dust.
6. There should always be an _____ plan for scheduled electrical maintenance or work.
7. If the victim is breathing and has a heartbeat, give _____ for injuries and treat for shock.
8. A fire extinguisher is a _____ containing an agent which can be discharged to extinguish a fire.

C. State whether the following statements are True or False

1. The organisation's policies and guidelines is the best guide to handle emergency.
2. If someone is injured, act as per your impulse or gut feeling.
3. Keep water and food items away from electrical equipment.
4. Always switch off the electrical circuits.
5. Always wear protective equipment, such as gloves and shoes.
6. A fire extinguisher is a protection device used to extinguish fires.
7. Flammable materials can be placed around an door exit.
8. You can determine possible evacuation routes from floor plan diagrams posted in your facility.



D. Short answer questions

1. What is a workplace emergency?
2. How do you protect yourself, your employees, and your business?
3. What is an emergency action plan?
4. What should your emergency action plan include?
5. How do you develop an evacuation policy and procedures?
6. How do you establish evacuation routes and exits?
7. What are the various types of fire extinguisher and their extinguishing material?
8. What are the steps for operating a fire extinguisher in case of a fire emergency.
9. Compare the different type of fire extinguisher.
10. List the different class of fire.
11. List out electrical rescue techniques.
12. What is the first aid for electrical emergencies?

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