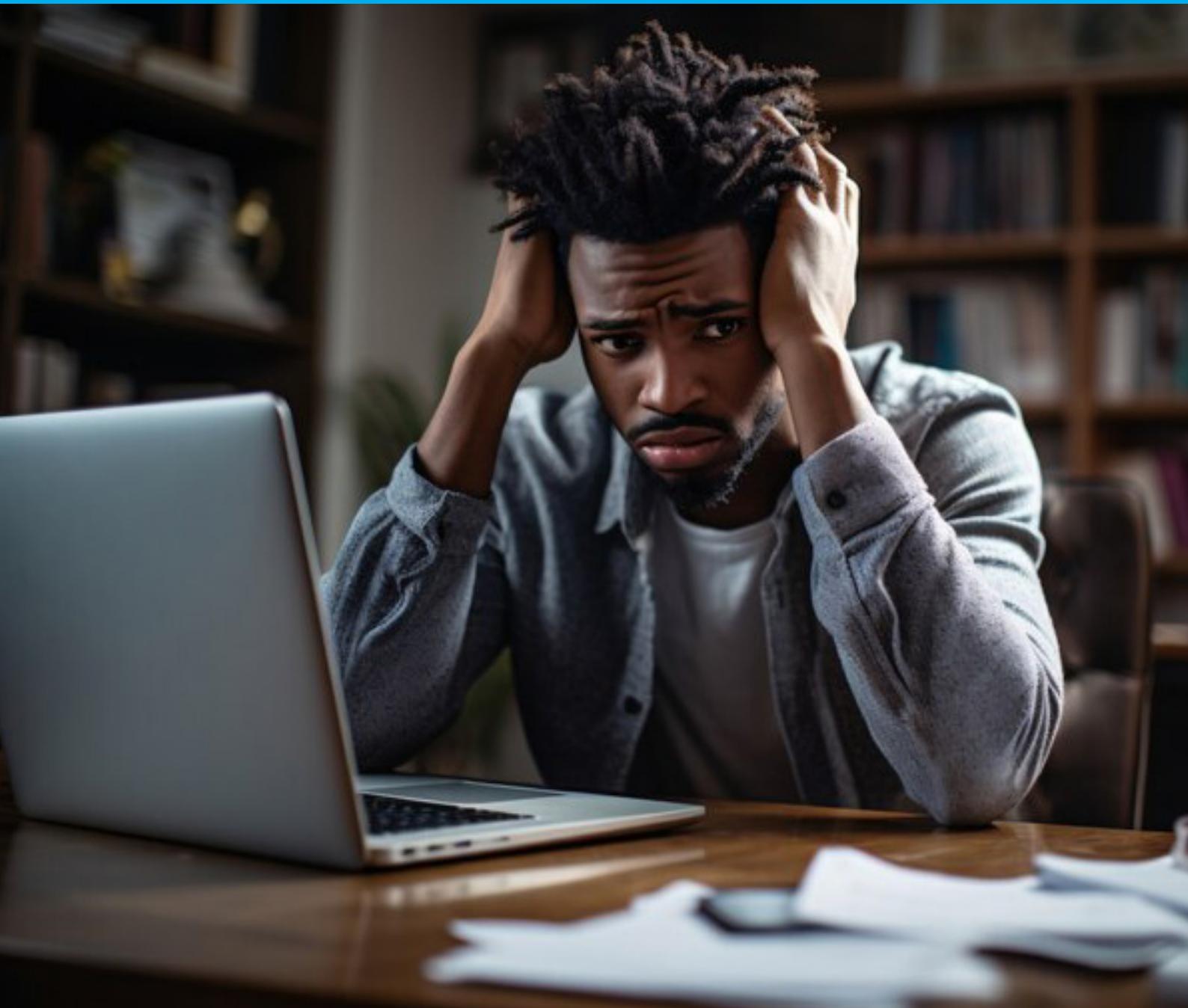


SECTION

5

**PHYSICAL SAFETY
HARZARDS IN THE USE OF
COMPUTERS- CAUSES AND
PREVENTIVE MEASURES**



NETWORK SYSTEMS FOR TRANSMITTING INFORMATION

Computer and Information Security

Introduction

In today's digital age, our computers are our constant friends, whether we are working, studying, or streaming online for entertaining videos or information.

Spending long hours at your desk can hurt more than just your productivity. It can also lead to back pain and other health related issues.

This section is design to equip you with all that you need to know to stay safe when using your computer and other digital tools

From the gradual backaches and neck pains to the eye strain that creeps up after too much screen time, the physical risks of computer use are all too real. It's not just about having a comfy chair; it's about creating a workspace that keeps you healthy and happy.

This section also explores the risks to personal safety linked to the use of computers, mainly from electrocution, fire, trips and falls, and personal injuries. Personal injuries covered include MSDs, eye strain, headaches and vertigo. The causes of these risks are studied, as well as how the risks can be mitigated. Risks of personal injuries can develop from sleep deprivation and mental illness, linked to the use of digital technology, so these topics are included.

Come along, as we explore how to protect yourself from these hidden hazards and turn your computer time into a safer and more enjoyable experience.

At the end of this section, you will be able to:

- Discuss the Causes of Physical Safety Risks of computer equipment
- Apply preventive measures on physical safety risks (including an increase in the number of wall sockets and not using too many extensions blocks
- Discuss Physical Safety Risks (Electrocution, Fire hazard, Tripping hazard, Personal injury) in the use of computer

Key Ideas:

- **Computer Safety Hazards:** These are health problems that computers and other digital devices pose to computer users.

- **Musculoskeletal Disorders (MSDs):** are disorder problems that affect your muscles, bones, joints, and the tissues around them
- **Repetitive Strain Injury (RSI):** refers to a range of conditions caused by repetitive motion or overuse of a specific part of the body.
- **Headaches and Vertigo** can be significant issues for individuals who spend extended periods working with computers. Both can stem from a range of causes related to computer use.
- **Vision and Hearing Problems from Using Computers:** Using computers for extended periods can lead to both vision and hearing problems.
- **Sleep Disorder and Weight Problems:** Extended screen time before bed can result in poor sleep which can also lead to weight problems.
- **Depression and Anxiety:** Depression makes you feel persistently sad and uninterested in life, while anxiety makes you feel constantly worried or fearful. Both conditions can be a health hazard from using a computer.
- **Trips and Falls** are two related hazards that people are exposed to in environments where electrical (including signal) cables and electronic devices are installed.
- **Electrocution and Fire Risks:** Electrocution occurs when a person comes into contact with an electrical source and becomes part of the electrical circuit, leading to electric shock and potential injury or death. Faulty computer equipment, sockets, and cables can spark an electric fire in an office or building.

Introduction to Physical Safety Risks When Using Computers.

Electronic devices such as laptops, smartphones, tablets and game consoles have become an integral part of our daily lives. As a result, we spend so much time looking at these devices. Though these devices provide us with much convenience, there are certain hazards these devices come along with.

As a learner, who loves to spend much time (screen time) on your laptop or smartphone either surfing the internet or entertaining yourself with computer games, you should be aware of these hazards.

Now, take this activity to come out with some possible risk you might be subjecting yourself to as a computer user.

Activity 5.1: Searching for possible safety risks in the use of computers.

1. Open any web browser of your choice and navigate to your search engine of choice
2. Type “possible physical safety risks in the use of computers”

3. Click on any hyperlink to display content of your search results (if the content does not reflect a good understanding of desired searched result, go back and select another hyperlink).
4. Make a list of possible physical safety hazards in the use of computers from your search result in your writing material.
5. Present and discuss your findings to your peers.

Now that you have been able to identify some possible physical safety risks in the use of computers, we will discuss two of these safety risks in this lesson: musculoskeletal disorders and repetitive strain injury (RSI) when using computers.

Musculoskeletal Disorders (MSDs)

Before we proceed, let us look at what the term “musculoskeletal” means.

Musculoskeletal is formed from two words which are muscles and skeletons. Muscles are the soft tissue that contract to move bones and maintain posture while skeletons are the bones that provide framework and support for the body. The term Musculoskeletal therefore refers to the system of muscles, bones, and connective tissues that work together to support and move the body. When these muscles and skeletons are unable to function properly, then we can say there is a disorder.

Musculoskeletal Disorders are therefore disorder problems that affect your muscles, bones, joints, and the tissues around them. These problems can make it hard to move or cause pain and discomfort. Common examples include back pain, arthritis, and repetitive strain injuries like carpal tunnel syndrome. Using a computer for a long time can lead to musculoskeletal problems because of how we sit and move while working.

Causes of Musculoskeletal Disorders (MSDs)

- **Poor posture:** If you sit in an awkward position, it can strain your back, neck, and shoulders.
- **Repetitive tasks:** Doing the same motions over and over, such as typing or using a mouse can lead to pain or discomfort in your wrists, hands, and fingers. Using one part of your body too much without giving it a break can equally result in muscles, bones and joints problems
- **Improper desk setup:** If your chair, keyboard, or monitor is not positioned correctly, you might have to stretch, which can cause muscle and joint issues.
- **Lack of movement:** Sitting or standing for long periods without moving can lead to stiffness and pain in your back and legs. This can equally result in bone and muscles stains and pains causing musculoskeletal problems.
- **Improper ergonomics:** This is when your workspace or device is not set up to fit your body well. This can cause discomfort, pain, and long-term health issues.

Preventive Measures for Musculoskeletal Problems from using computers

Now that you have been introduced to some of the causes of musculoskeletal disorders with regards to using computers and other computing devices, let us look at what you need to do to stay safe from these disorders when using your computing devices by taking this activity.

Activity 5.2: Preventive Measures for Musculoskeletal Problems

Follow these instructions to ensure you are prevented from developing musculoskeletal problems when using a computer at school and at home.

Instructions

1. Follow these steps to ensure proper ergonomics to prevent musculoskeletal problems.

Steps:

- a. Sit in your chair and adjust the height so that your feet are flat on the floor and your knees are at or just below hip level.
 - b. Adjust the backrest to support your lower back.
 - c. Ensure your desk is at a height where your elbows are bent at a 90-degree angle when typing.
 - d. Position your monitor so the top of the screen is at or slightly below eye level and about an arm's length away.
 - e. Place your keyboard and mouse within easy reach. (*Your wrists should be straight and not bent up or down while typing.*)
2. Sit with your back against the chair, shoulders relaxed and feet flat on the floor. Avoid leaning forward.
 3. Position your screen well so you don't need to tilt your head up or down to see it comfortably.
 4. Stretch and move your neck, wrist, legs and roll your shoulder forward and backward for a few seconds by following these steps. (It helps reduce tension in your neck, wrist and shoulders)
 - a. Neck Stretch: Tilt your head towards one shoulder, hold for 15 seconds, then switch sides. This helps reduce neck strain.
 - b. Shoulder Rolls: Roll your shoulders forward and backward for 30 seconds each. This helps relieve shoulder tension.
 - c. Wrist Stretch: Extend one arm out, palm up, and gently pull back on your fingers with the other hand. Hold for 15 seconds on each side to stretch your wrists.

- d. Leg Stretch: While seated, extend one leg out straight and hold for 15 seconds, then switch legs. This improves circulation in your legs.
- 5. Use a timer or reminder to take breaks every 30-60 minutes. Stand up, stretch, or walk around to keep your body active and prevent stiffness.
- 6. Now copy and complete **Table 5.1** for causes and preventive measures of musculoskeletal problems on your cardboard and paste it in your classroom.

Table 5. 1: Causes and Preventive Measures of Musculoskeletal Disorders

Causes		Prevention
1	Poor Posture	Adjust Your Workspace: Set up your chair, desk, and monitor to support good posture and sit with your back against the chair, shoulders relaxed, and feet flat on the floor. Avoid leaning forward
2		
3		
4		
5		
6		

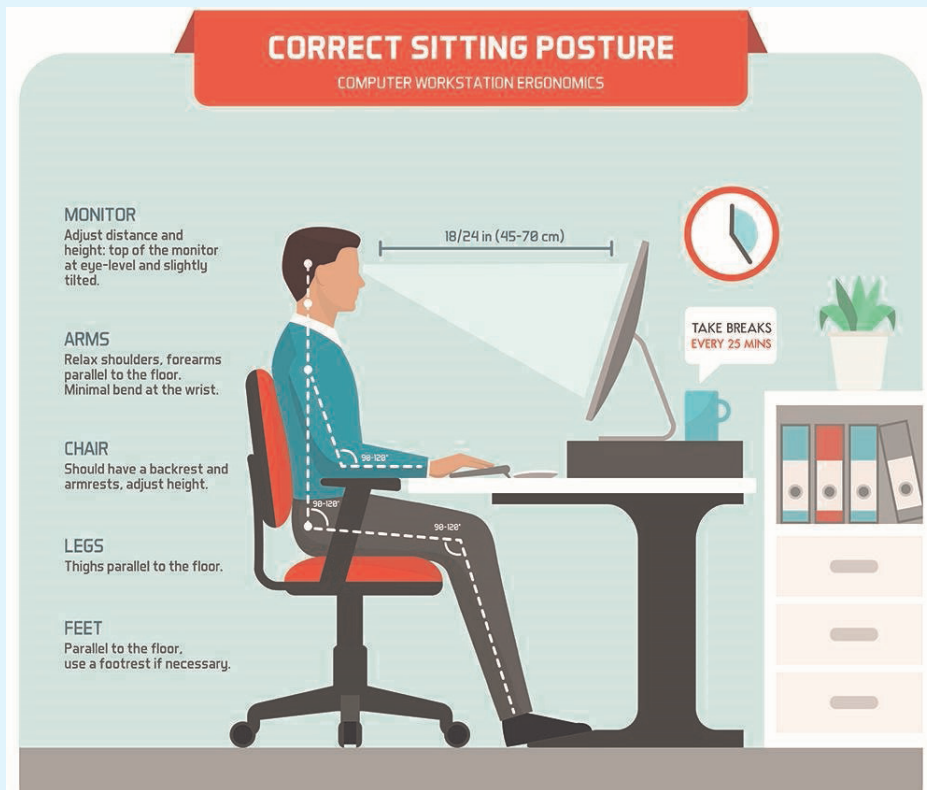


Figure 5.1: Proper Ergonomic Workstation

Repetitive Strain Injury (RSI)

Repetitive strain injury (RSI) happens when you do the same movement over and over again. Particularly like typing, using a mouse or using a game console. RSIs can affect various body parts, including fingers, thumbs, wrists, elbows, neck, back and arms. This can lead to pain or discomfort in the affected part of your body. Repetitive strain injury (RSI) is a subset of musculoskeletal disorder as mentioned earlier.

Activity 5.3: Causes And Preventive Measures for Repetitive Strain Injury

Steps:

1. Study figure 5.2 below carefully

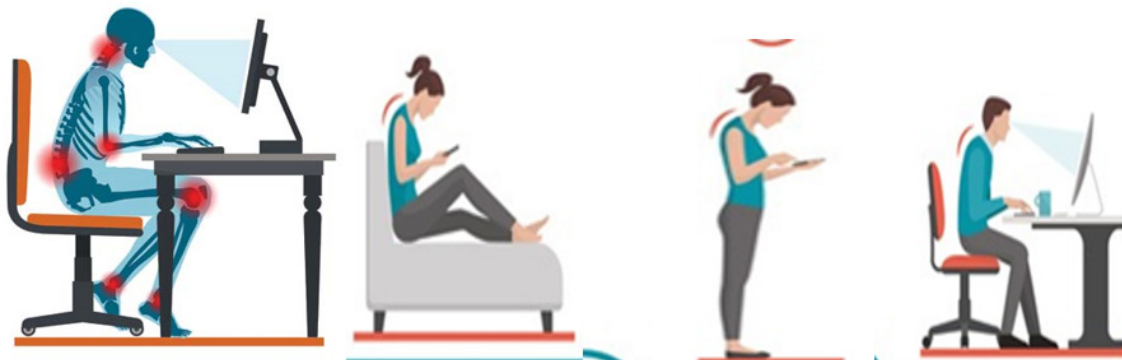


Figure 5.2: Causes of Repetitive Strain Injury

2. Write possible Repetitive Strain Injury problem in each situation in figure 5.2.
3. Write what could be done to prevent the problem in each situation in figure 5.2
4. After going through instructions 2 and 3, write your own definition of Repetitive Strain Injury.
5. Prepare a PowerPoint presentation that outlines the causes and preventive measures for RSI
6. In the presentation, list at least five causes of RSI and actions that can prevent it when working with a computer.
7. Present your work for peer review.

8. Compare your findings with **Table 5.2**.

Table 5.2: Causes and Preventive measures for Repetitive Strain Injury

Causes	Prevention
Repetitive Movements	Take Regular Breaks: Take a 1–2 minute break to stretch and move in every 30-60 minutes.
Poor Posture	Adjust Your Workspace: Set up your chair, desk, and monitor to support good posture.
Incorrect Ergonomics	Choose an ergonomic keyboard and mouse and other Ergonomic Equipment.
Prolonged Computer Use	Incorporate Movement when using computers. You could stand, stretch, or walk around regularly.
Poor Desk and Chair Setup	Ensure your feet are flat on the floor and your elbows are at a 90-degree angle.
Incorrect Keyboard and Mouse Position	Position your keyboard and mouse close so your wrists are straight, and your hands are comfortable.
Lack of Proper Stretching	Perform Stretching Exercises. Regularly stretch your wrists, hands, and shoulders.
Typing with Excessive Force	Type Gently: Avoid pounding on the keyboard; use light, relaxed keystrokes.

Vision Problems

Symptoms, Causes and Preventive Measures of Vision Problems, Hearing Loss, Headaches and Vertigo from Using Computers.

Previously, we looked at some possible physical safety risks in the use of computers and discussed causes and preventions of Musculoskeletal Disorder (MSDs) and Repetitive Strain Injury (RSI). In this lesson, we will take a look at symptoms, causes and preventive measures of the following physical safety risks in the use of computers:

- Vision problems
- Headaches and vertigo
- Hearing loss

Now, take this activity to explore your understanding of these computer related health risks

Activity 5.4: Finding Possible Causes of Headaches, Hearing Loss And Vision Problems

Steps:

1. Write five or more possible causes of headaches, hearing loss and vision problems that we can face in our everyday life.

Out of the causes written in step 1, mark out those that relate to computer usage.

2. Discuss with your peers causes of headaches, hearing loss and vision problems in using computers from step 2 for better understanding.
3. Put your findings into a table after the discussion using an A3 sheet and paste it in the classroom.

Having completed these steps, you have gained the understanding that headaches, vision problems as well as hearing difficulties can be as a result of improper use of computers and other digital devices in our daily lives. Now let us probe further into these health risks, their symptoms, and how to prevent them from happening to us since computers and digital tools have come to stay with us.

Vision Problems Associated with Computer Usage

Eyes Strain

Eye strain, or digital eye strain, happens when your eyes get tired from focusing on something for a long time, especially screens of computers, phones, or tablets. Working for long periods on the computer can strain your eyes or worsen existing eye conditions. Symptoms include eye discomfort, headaches, itchy eyes and difficulty focusing. – see Figure 5.3.

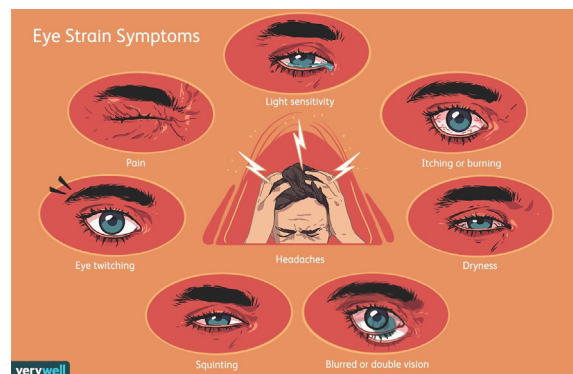


Figure 5.3: Common Symptoms of Eye Strain

In most cases, eye strain is temporary and tends to resolve within a few hours or days once the triggering activities, such as prolonged screen use or reading in poor lighting, are reduced or eliminated.

Causes of Eye Strain Associated with Computer Usage

Eye strain from computer use, also known as Computer vision syndrome (CVS), can occur due to several factors. These are:

1. **Poor lighting:** Working in an area with too much or too little light, or with glare from windows or screens, can cause your eyes to strain as they adjust to the brightness contrast.
2. **Prolonged Screen Time:** Staring at a screen for long periods without breaks can tire the eye muscles, leading to discomfort.
3. **Incorrect Viewing Distance or Angle:** Sitting too close or too far from the screen, or positioning the monitor too high or low, can cause eye strain as your eyes constantly refocus.
4. **Reduced Blinking:** People tend to blink less when focusing on a screen, which can lead to dry eyes, irritation, and fatigue.
5. **Blue light Exposure:** Screens emit blue light, which can interfere with your sleep cycle and contribute to discomfort after long hours of exposure.
6. **Screen Glare and Reflection:** Reflections on the screen can make it difficult to see the content clearly, causing your eyes to work harder.

Preventive Measures to Avoid Eye Strain

1. Take frequent breaks from computer work. Employ the 20-20-20 rule: Every 20 minutes, take a 20-second break to look at something 20 feet (6 metres) away.
2. Ensure your main light source (such as a window) is not shining into your face or directly onto the computer screen.
3. Tilt the screen slightly to avoid reflections or glare. Use an anti-glare screen or glasses.
4. Make sure the screen is not too close to your face.
5. Put the screen either at eye level or slightly lower.
6. Reduce the contrast and brightness of your screen by adjusting the controls.
7. Frequently look away from the screen and focus on far away objects.
8. Have regular eye examinations to check that any underlying disorders do not cause any blurring, headaches or other associated problems.

Activity 5.5: Search For Causes and Impact of Eye Strain on Headaches.

Steps:

1. Open any web browser of your choice, and your preferred search engine.
2. Type “causes and impact of eye strain on headaches”.
3. Click on any hyperlink to display content of your search result (if the content does not reflect a good understanding of desired searched result, go back and select on another hyperlink).
4. Present your findings in a PowerPoint slideshow to the whole class for discussion.
5. Prepare for a questions and answers session at the end of your presentation.

Headaches and Vertigo Problems Associated with Computer Usage.

Now that you have been able to identify eye strain, its causes and impact on headaches, let us discuss headaches and Vertigo problems associated with computer usage.

Headaches

A headache is pain or discomfort in the head, scalp, or neck, and it can have various causes. It can occur on one side of the head or both sides. Headaches are often accompanied by nausea, vomiting and extreme sensitivity to light and sound. A migraine is a headache that goes beyond typical head pain. People who suffer migraine experience severe throbbing or pulsing pain (pounding pain). Figure 5.6 gives the various types of headaches that one can experience.

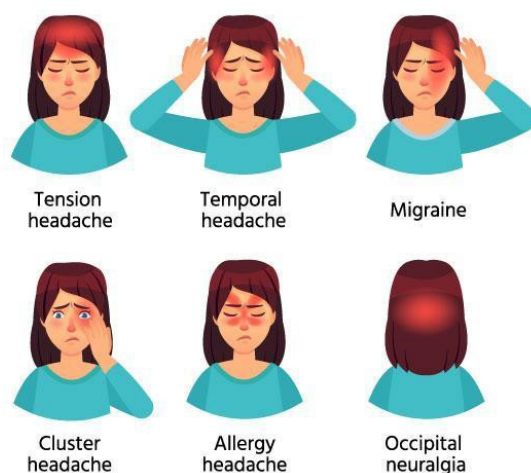


Figure 5.4: Types of Headaches

Vertigo

Vertigo is a condition that makes someone feel like they or the environment around them is spinning or moving even when they are standing still. It is a type of dizziness that can be uncomfortable and disorienting. It is often associated with inner ear problems or disturbances in the vestibular system. Common symptoms of vertigo include dizziness that can last from minutes to hours (or even days), unsteadiness and loss of balance and sensitivity to motion. Subjective hearing symptoms (such as ringing, fullness or pressure in the ears) may also occur.

Causes of headaches and vertigo in the use of computers

1. Spending much time in front of a computer screen (or any screen) can trigger headaches due to eye fatigue.
2. Light sensitivity is a common migraine trigger. Flickering or bright screens aggravate vestibular disorders that provoke dizziness and headaches.
3. Cybersickness (like motion sickness) can occur due to computer-generated graphics, videos and fast-paced films.

Preventive measures for headaches and vertigo relating to the use of computers

1. Employ the 20-20-20 rule: After every 20 minutes, take a 20-second break to look at something 20 feet (6 metres) away.
2. Rest eyes completely for 15 minutes after two hours of continuous computer use.
3. Adjust paper or reading material to minimise eye travel between paper and monitor.
4. Arrange regular eye care, including prescription glasses if needed.
5. Manage screen brightness and consider using blue light filters to reduce sensitivity when working with computers.
6. Take breaks from screens.
7. Optimise screen brightness and contrast.
8. Use anti-glare screens.
9. Practise good posture and eye exercises.



Figure 5.5: Vertigo Victims

Activity 5.6: Creating a Mind Map

Create a mind map of one of the following:

- a. Headaches and the use of computers, symptoms, causes, and preventive measures.
- b. Vertigo and the use of computers, symptoms, causes, and preventive measures.

Instructions

Assuming you are using the Internet for your research, follow these steps,

1. Open any web browser of your choice, and your search engine of choice.
2. Type “Headaches and the use of computers, symptoms, causes, and preventive measures” in the search box, assuming you choose the first option (A), and press Enter.
3. Click on any hyperlink to display content of your search result (if the content does not reflect a good understanding of desired searched result, go back and select another hyperlink) in the search results.
4. Use an A3 Sheet paper or a computer program to create your mind map.
5. Present your map to the whole class.

Hearing Loss

Many people nowadays use headphones or earbuds to listen to sounds from their smartphones, video games, computers, MP3 players and TVs. Loud noises can destroy tiny hair cells in your inner ear, resulting in permanent hearing loss. These tiny hair cells are important because they signal the auditory nerve to send sound messages to your brain. Hearing loss is an irreversible process, and measures should be taken to

prevent it. Hearing loss can also result in Vertigo which is often caused by problems with the inner ear or the brain.

Causes of an increased risk to hearing loss linked to the use of computers

These include:

1. Regularly listening to music or sounds on your computer or game consoles with earbuds and in-ear headphones at extremely loud volumes.
2. Excessive use of headphones and earphones during remote work. If the exposure to sound is prolonged, its intensity does not need to be very strong: 80 dB (decibel) a day without interruptions is enough to cause serious damage to hearing.
3. In addition, earbuds can increase the risk of ear infections due to germs and bacteria that can settle on these objects and be transferred inside the ear canal.



Figure 5.6: Causes of an increased risk to hearing loss

Preventive Measures for Computer-Related Hearing Loss

These include:

1. Set the volume of the computer, tablet or smartphone to 60% and take a break of a quarter of an hour for each hour of listening
2. Disinfect the earphones and EarPods every day after use to avoid the proliferation of germs and bacteria
3. Do a hearing check if you experience some symptoms of hearing loss, such as difficulty listening to dialogue or hearing doorbells and alarms

Activity 5.7: Create an Infographic on Preventing Computer-Related Headaches and Vertigo.

Material needed: Cardboard papers, Markers, colour pencils, rulers, computer software etc.

Instructions:

1. Design an infographic (poster, chart or diagram) that summarises strategies to prevent headaches and vertigo caused by prolonged computer use.
2. Use the Internet to research different poster designs and use it to support your work.
3. Design your poster on cardboard paper or use a computer software such as Photoshop or CorelDRAW for your design
4. Your design should have the following:
 - a. Title:
 - b. Visuals
 - c. Content: Key prevention tips such as Proper posture, Taking breaks, Ergonomic setup, Hydration and eye care, Room lighting and ventilation.
4. Present your Infographic to the entire class for discussion.

Causes and Preventive Measures of Sleep Disorders, Weight problems, Depression and Anxiety

This section focuses on how excessive use of computers can affect your body and mind. Spending too much time on the computer, especially at night, can lead to sleep problems and weight gain. It can also make you feel sad, worried, or stressed, leading to depression and anxiety. By understanding the symptoms, causes, and ways to prevent these issues, you can use computers in a healthier way.

To stay healthy, it is important to manage your screen time, take breaks, and balance your computer use with other activities like exercise and spending time with friends and family.

SLEEP DISORDERS AND WEIGHT PROBLEMS

Using computers for long hours without breaks, can result in sleep and weight problems. Now let us look at what each of these conditions refer to:

Sleep Disorders

Sleep disorders include different problems that affect how well and how long a person sleeps. These issues can seriously affect a person's health, mood, and ability to stay alert during the day. Some common sleep problems caused by using computers too much are trouble falling asleep (insomnia), waking up often during the night (restless sleep), sleeping at the wrong times (circadian rhythm disorders), feeling sleepy during the day, and having broken or interrupted sleep (sleep fragmentation).

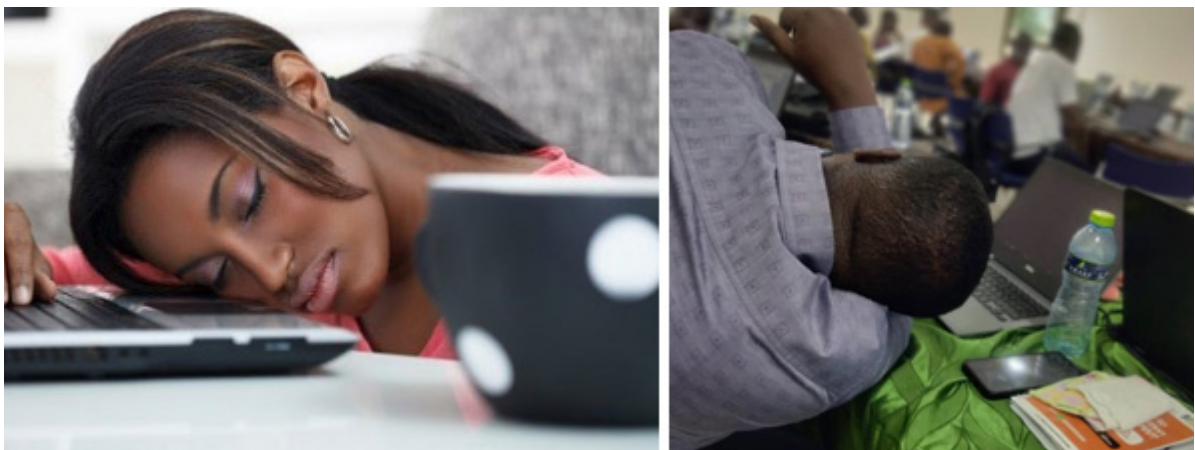


Figure 5.7: Sleep Disorder

Causes of sleep disorders linked to the use of computers

The following are some of the causes of sleep disorders:

1. **Exposure to blue light:** Using screens like smartphones, tablets, and computers exposes you to blue light, which can affect your sleep. This blue light stops your body from producing melatonin, a hormone that helps you sleep, making it harder for you to fall asleep at night.
2. **Cognitive stimulation and late-night technology use:** Using digital devices like smartphones, computers, and tablets before bed can keep your brain active and make it hard to relax. Activities like watching TV, checking social media, and playing video games before sleeping can mess up your sleep schedule and make it difficult to fall asleep on time.
3. **Sedentary Behaviour:** Long hours spent sitting at a computer can reduce physical activity, which is important for promoting good sleep. Lack of exercise can lead to restlessness at night.

4. **Stress and Anxiety:** Excessive use of computers for work, social media, or entertainment can contribute to stress or anxiety, which can interfere with the ability to relax and sleep well.
5. **Multitasking and Overuse:** Constant multitasking and long hours of use can lead to mental fatigue, but paradoxically, this often prevents restful sleep, as the brain struggles to “wind down.”

Preventive Measures for Sleep Disorders Due to Computer Use

A variety of measures can be adopted to prevent sleep disorders. The following are some of the popular ones:

1. **Using blue light filters:** To reduce the effect of blue light on your sleep, you can use blue light filters on your devices or try to avoid screens at least an hour before going to bed.
2. **Create a good sleep environment:** To create a good sleep environment by:
 - Make sure your bedroom is dark, quiet, and calming.
 - Keep electronic devices like TVs, computers, and smartphones out of your bedroom.
 - Set the room to a comfortable temperature for sleeping.
3. **Limit screen time:** Set rules for how long you use technology before bed. Try to have at least 30 minutes of screen-free time before sleeping.
4. **Technology to help with sleep:** You can manage sleep disorders by making use of sleep technologies such as:
 - Fitness trackers or smartwatches with sleep apps can help you track your sleep and give tips for improving sleep quality.
 - Smart beds have features like adjusting temperature and firmness to help you sleep better. Some can even reduce snoring. They can also connect with other smart devices in your home, like lights and thermostats, to create a better sleep environment.

Weight Problems Linked to Computer Use

Being overweight or obese means having too much body fat, which can be harmful to your health. Spending a lot of time on screens, like watching TV or using computers, can be linked to weight problems. Studies show that teens who watch TV for five hours or more a day are five times more likely to become overweight. This is often because

they get less exercise and snack more while using screens. Also, the light from screens can mess with your sleep, making it harder to get good rest. Not getting enough sleep has been shown to increase the risk of gaining weight.

Depression and Anxiety

The next health risks to be discussed here is depression and anxiety. Take this activity to help you gain the foundational understanding of depression and anxiety.

Activity 5.8: Understanding Happiness, Depression and Anxiety.

In this activity, carefully study *Figure 5.8* and *Figure 5.9* and answers the questions that follow:



Figure 5. 8

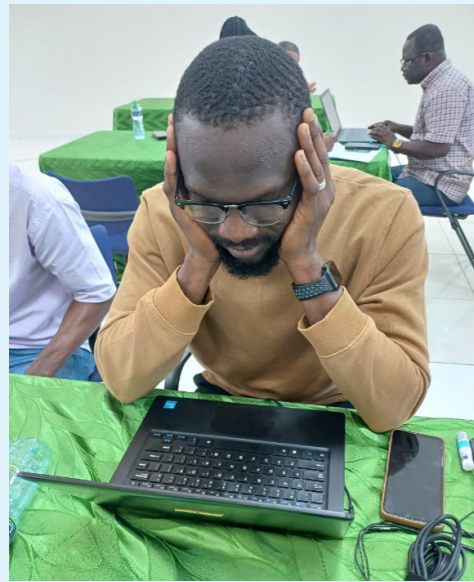


Figure 5.9

Instructions:

1. Study figure 5.8 and write down five words that describe the person in the image.
2. Study Figure 5.9 and write down five words that describe the person in the image.
3. Write down what could have caused a computer user to end-up like the person shown in Figure 5.8
4. Write down what could have caused a computer user to end-up like the person shown in Figure 5.9
5. Present your findings to your class facilitator for marking and discussion.

What is Depression and Anxiety?

Depression is a mental health issue where you feel sad all the time and lose interest in

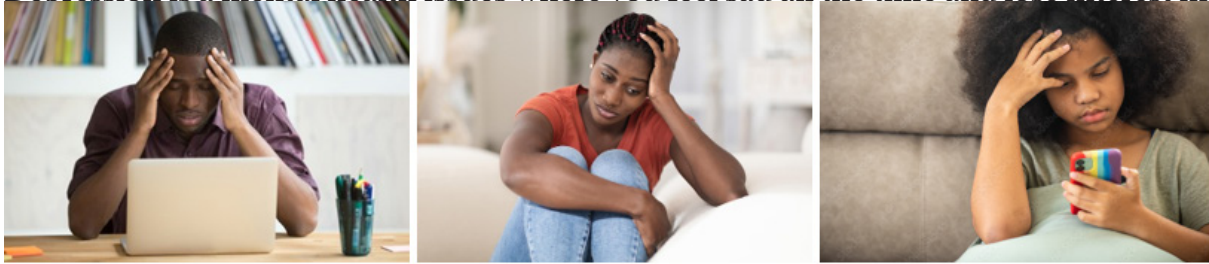


Figure 5.10: Victims Depression and Anxiety

Causes Of Depression and Anxiety Linked to the Use of Computers

There are various factors that cause depression in computer users. Here are the most common ones:

1. **Problematic Internet Use (PIU):** This happens when the use of the Internet causes problems in your life. For instance, difficulties with your emotions, social life, school, or work. It can include habits like spending too much time playing video games, shopping online, gambling, streaming videos, or using social media. People with PIU often struggle to control how much time they spend on digital devices.
2. **Smartphone dependency:** Some people use their smartphones so much that they can't stop, even until the battery dies. When this becomes a habit, it can lead to depression and anxiety. Using smartphones excessively can also become an addiction, affecting daily life and relationships.
3. **Social media harm:** Teens may engage in dangerous behaviours because of too much or unfiltered use of social media. For example, they might try extreme diets or take risky photos just to follow trends. Cyberbullying and online harassment can also cause emotional pain and lower self-esteem.
4. **Bad sleep habits:** Using computers too much, especially late at night, can lead to poor sleep. This lack of good sleep can contribute to feelings of depression and anxiety.
5. **Social isolation:** Spending too much time online can reduce face-to-face interactions and increase feelings of loneliness.
6. **Technostress:** This is the stress, anxiety, or discomfort you feel when you are overwhelmed by new technology. It happens when you struggle to keep up with and use technology in a balanced and healthy way.

Preventive Measures for Depression and Anxiety Due to Computer Use

The following strategies can be used to prevent depression and anxiety that arise as a result of computer use:

1. **Limit screen time:** Spending too much time in front of screens can lead to mental health issues. Set limits on how long you use screens and take regular breaks to rest your eyes and mind.
2. **Mindful usage:** Pay attention to how using your computer affects your mood. If you start feeling bad, try changing your habits.
3. **Ergonomics:** Make sure your computer setup is comfortable and safe for your body. This can prevent physical discomfort that might also affect your mental health.
4. **Social interaction:** Balance your time online with real-life social activities. Make time for face-to-face conversations and build meaningful relationships.
5. **Physical activity:** Regular exercise is good for your mental health. Include activities like walking or stretching in your daily routine.
6. **External help:** If you are struggling, talk to a therapist or doctor. You can also try online programs designed to help with anxiety and depression.
7. **Blue light filters:** Use blue light filters or night mode on your devices. This can help protect your sleep patterns and improve your mood.

Now, let us take these activities for better understanding of causes, symptoms and prevention of computer related sleep disorders, weight problems, Depression and anxiety.

Activity 5.9: Creating a Diary Entries for a Fictitious Learner Suffering from a Mental Health Disorder Due to Digital Technology.

Carefully read the scenario below:

Adjei is a senior high school learner who has been using digital devices for long periods daily. He is facing issues like sleep deprivation, anxiety, and mood swings. All these issues are affecting his schoolwork (academic performance) and relationships.

Instructions:

1. Individually, write a week's worth of diary entries (7 days) for this fictitious learner.
2. Each diary entry should describe the following:
 - a. How technology use is impacting his physical and mental well-being.
 - b. The symptoms he is experiencing.

- c. Any social or academic challenges he is facing.
 - d. Any attempt he is making to improve his mental health.
5. Write at least 3-4 sentences for each diary entry. Be specific about the challenges faced and feelings experienced.
 6. Submit your work to your class facilitator for marking and discussion.

Your diary should be in the format shown in the table 5.3 below:

DAYS	MENTAL HEALTH DISORDER(S)
DAY 1 (Sunday)	He feels completely drained. He needs help, but he is too scared to ask for it. He feels embarrassed that he has let things get this bad. His mind is always buzzing, and he does not remember the last time he truly felt relaxed. He wishes he could just unplug, but it feels impossible.
DAY 2 (Monday)	
DAY 3 (Tuesday)	
DAY 4 (Wednesday)	
DAY 5 (Thursday)	
DAY 6 (Friday)	
DAY 7 (Saturday)	

Table 5.3: Diary Format Sample

Setting up a Blue Filter on your Computer

Blue Light Filters on computers are available for both Mac and Windows operating systems.

Activity 5.10: How to turn down blue light on devices with Mac OS.

To turn down blue light on Mac operating system, follow these steps:

1. Click on the Apple icon located at the top-left corner of the computer screen.
2. Click on the 'System Preferences.'
3. Click on 'Displays.'
4. Toggle over to the 'Night Shift' section.

5. Click on the box next to 'Turn on Until Tomorrow' to switch the blue light filter on; alternatively, set up a schedule by clicking the dropdown next to 'Schedule.'

Activity 5.11: How to Turn Down Blue Light on an iPad or iPhone.

To turn down blue light on **an iPad or iPhone**, follow these steps:

1. Open 'Control Centre.'
2. Touch and hold the 'Brightness' control icon.
3. Tap the 'Night Shift' button to turn Night Shift on or off.

Or

1. Go to Settings > Display & Brightness > Night Shift.
2. On the same screen, you can schedule a time for Night Shift to turn on automatically and adjust colour temperature. See figure 5.12



Figure 5.11: Turning down blue light on an iPad or iPhone

Activity 5.12: How to Turn Down Blue Light on a Windows Computer.

To turn down blue light on Windows operating system, follow these steps:

1. Open the 'Start menu.'
2. Click on the 'Gear' icon to bring up the 'Setting' menu.
3. Click on 'System.'
4. Select 'Display.'
5. Toggle the 'Night Light' Switch to 'On.'
6. Click on 'Night Light Setting' to adjust the Blue Light level displayed or schedule a time for 'Night Light' to activate automatically.

Digital devices are important for many jobs and activities for both adults and children. However, using these devices for long periods or in the wrong way can lead to health problems. Computer screen blue light filters give some protection for your eyes, but it is not enough on its own. To better protect your eyes, you can wear blue light-blocking glasses or use glare-reducing lenses. You can also place a blue light filter panel in front of your monitor.

While technology makes life easier and helps us stay connected, it is important to find a balance and pay attention to how it affects your mental health.

Activity 5.13: Understanding Mental Health and the Role of Sleep

In this activity, you are going to identify common mental health disorders; how technology use and sleep quality can impact mental health, its effects on everyday life and academic performance.

Materials needed:

1. Digital devices (computer, tablet, or smartphone) with internet access.
2. Textbooks for research.
3. Pen and paper for reflection

Instructions:

1. In groups, discuss what mental health means.
2. Each group should write down their definition of mental health
3. Each group chooses one of these mental health disorders [depression, anxiety, social media addiction, bipolar disorder, ADHD (Attention Deficit Hyperactivity Disorders) and research on it; taking into consideration the main symptoms, how it affects everyday life and how it is linked to technology.
4. Each group discusses how lack of sleep or poor sleep quality contributes to their chosen mental health disorder.

5. Each group discusses how lack of sleep can contribute to their behaviour and academic performance.
6. Each group should write down all their findings and present it to the whole class for better understanding.

Activity 5.14: Creating a Web Diagram.

In this activity, you are going to create a web diagram that links causes and preventive measures to the physical and mental health issues studied.

Materials Needed:

1. Paper and pens (or digital drawing tool if available).
2. Markers or coloured pencils for highlighting connections.
3. Reference notes from previous lessons on mental and physical health issues caused by technology.

Instructions:

1. Write “Physical and Mental Health Issues” as the heading in the centre of the page.
2. Branch out from the centre, creating circles for each health issue (e.g., “sleep disorders”, “Anxiety”).
3. For each issue, create additional branches identifying the causes.
4. Use arrows to link the causes to the specific health problems they contribute to.
5. Add preventive measures to each branch.
6. Use different coloured arrows or lines to show the connection between preventive actions and the health issues they can help reduce.
7. Compare your web diagram with that of your colleagues and submit it to your class facilitator for a whole class discussion.

Activity 5.15: Research and Summary of Scientific Studies.

In this activity, you are going to explore how technology use affects sleep by researching two scientific studies, summarising their findings, and presenting your outcomes.

Materials Needed:

- Computer with internet access.
- Smartphone or Tablet with internet access.
- Textbooks or library resources.

- Projector.
- Notebook and pen.

Instructions:

1. Choose one of these scientific studies (Bedtime Use of Technology and Sleep Problems in Children and Screen Time and Sleep Disturbances Among Adolescents).
2. Open any web browser either on your computer, smartphone or tablet.
3. Type your chosen scientific studies topic in the search box of a search engine of your choice (e.g. Google).
4. Select a hyperlink to display the search result (if the displayed search result does not reflect a good understanding, go back and select another hyperlink).
5. Make relevant notes from the search results.
6. Write the summary of your findings, the summary should include: (the technology used in the study, the age group of participants, the main sleep issues identified, how technology use affects sleep patterns).
7. Present your findings to the whole class for further discussion and contributions from other colleague members.

Note: In the absence of digital devices and internet connectivity, use your textbooks or library resources to gather the relevant information needed for this activity.

Trips And Falls

Causes and Preventive Measures of Trips and Falls and Electrocutation and Fire Risks When Using Computers

Users of ICT systems as well as other persons within proximity are exposed to a variety of hazards. These hazards may result in instant physical injuries or long-term health effects or even death. Improperly secured electrical cables can lead to tripping by employees as well as clients at workstations. This could lead to injuries and removal of power cables from electrical sockets which could result in unexpected shutdown of equipment. Touching the positive and negative terminals of electrical cable can result in a short circuit which may blow the fuses or circuit breakers. It could also cause a fire. Many people have lost their lives through electrocution due to a short circuit of mains voltage. In the ensuing text, we would identify some of these risks, the causes, effects and the preventive measures.

Trips and Falls

Trips and falls are two related hazards that people are exposed to in environments where electrical (including signal) cables and electronic devices are installed. You would recognise that the use of computing equipment often involves sedentary (sitting), but tasks, cables, cords and other obstacles can create hazards that lead to trips, slips and falls. Trips occur when your foot collides (strikes, hits) with an object, causing you to lose balance and eventually fall.

Trips and falls can cause injuries, including musculoskeletal injuries, cuts, bruises, fractures and dislocations. Sometimes, it may lead to serious injury or even death, especially when the head hits against the ground.



Figure 5.12: Trip and Fall

Causes of Trips and Falls

There are various causes of trip and fall incidents in the working space and even at homes. The following are the well-known ones:

- **Cables and cords:** The presence of cables and cords running across floors or walkways is one of the main contributors to trips and falls in computing environments. These cables could be power cords, network cables and peripheral cables that connect devices to power outlets or other equipment.



Figure 5.13: Cables and Cords running across floors

- **Poorly organised workspaces:** Workspaces that are disorganised and cluttered can make trips and falls more likely since obstacles may be difficult to see and restriction of movement. This can contain miscellaneous documents, user manuals for equipment, and other things that gather on desks or floors.
- **Uneven surfaces:** Particularly in locations where ICT equipment is placed or accessed, uneven flooring or transitions between different flooring materials might present a tripping hazard.
- **Inadequate lighting:** Inadequate lighting increases the chances of trips and falls because it makes it hard to see obstacles and hazards in your path. Imagine walking through a computing environment at night without turning on the lights. You might trip over cables or bump into desks because you cannot see where you are going.

Preventive Measures for Trips and Falls

There is the need to adopt appropriate measures to prevent or mitigate the occurrences of trip and fall incidents at a workplace or residence. Here are some of the recommended ones:

- **Managing cables:** Reducing trip and fall dangers related to cables and cords requires proper cable layout and management. To keep wires from creating trip hazards, this entails securely routing them along walls or floors and fastening them with cable ties or clips. Make sure the area is free of any trailing wires that could trip someone.
- **Organising workspace:** Maintenance of clean and organised workspaces help minimise clutter and lower trip and fall incidents. Keep walkways clear of obstacles, store equipment and supplies properly, and have any spills or refuse promptly cleared. Keep bags and other obstacles saved out of the way to avoid tripping over by people.
- **Floor maintenance:** Regularly inspecting and maintaining floor surfaces are crucial for identification and addressing of potential tripping hazards. Surfaces that are uneven should be repaired; damaged flooring materials should be replaced, particularly in high-traffic areas.
- **Adequate lighting:** The risk of trips and falls can be reduced by adequately lighting work areas to enhance visibility.

ELECTROCUTION AND FIRE

Electrocution is a serious injury or fatality caused by electric shock. It can happen through direct contact with electrical sources, especially when combined with water or faulty equipment. Electrocution risks associated with the use of computing equipment pose a definite threat to physical safety, hence should not be ignored.

Aside from faulty computer equipment as a reason for an electric fire in an office or building, there are several other electrical related causes of fire at workplaces and homes.

For instance, a fire erupted in the Kumasi Central Market in 2023, destroying several stalls. The cause was linked to electrical faults from poor cabling in some shops. This incident from 2023 illustrates the ongoing issues related to improper electrical cabling at workplaces and homes in Ghana. A fire can have devastating effects such as damage, disruption, costly repairs and sometimes, burns and loss of life.

Causes of Electrocutation and Fire Risks

There are various factors that can spark up electrocution and fire outbreaks in an electronic environment. The prominent ones are outlined as follows:

- **Improper installation:** This includes exposed wires and worn-out cords. Improperly installed or damaged electrical wiring can cause electrocution and fire outbreak.
- **Faulty equipment:** Fire can be caused by malfunctioning or faulty ICT equipment such as computers, monitors, printers, and peripherals. Faulty wiring or equipment can produce sparks when electricity flows through damaged components. A malfunction can lead to excessive heat buildup, which can ignite surrounding materials and lead to a fire.
- **Water:** Operating electrical equipment under wet conditions increases the risk of electrocution. Water is a conductor of electricity and can facilitate the flow of electric current through the body.
- **Overloaded circuits:** Overloading electrical circuits with too many devices or appliances can lead to overheating and potential spark of electrical fires. This may lead to burns, suffocation, and possibly death.
- **Covering air vents on a computer:** This can block airflow, leading to overheating and potential damage.



Figure 5.14: Overloaded and Faulty Sockets

Preventive Measures for Electrocutation and Fire Risks

It is crucial to put in place measures (systems) to forestall the occurrences of electrocution and fire outbreaks in the workplace and home to protect lives and properties.



Figure 5.15: Residual Circuit Devices (RCDs)

Here are the most common measures that can be adopted to mitigate electrocution and fire:


- **Proper Wiring:** Proper wiring involves using quality materials, correct installation, good insulation, avoiding overloaded circuits, using circuit breakers, and regular inspections. These practices help prevent electrocution and fires, keeping you and your home safe.
- **Safety Training:** Electrical safety training is essential for raising awareness to help recognise and respond to electrocution hazards on time and effectively.
- **Circuit Interrupters:** Surge protectors, circuit interrupters and uninterruptible power supplies (UPS) can be used to help protect users and equipment from incidences of power surges such as electric shocks and fire outbreaks. It can also prevent data loss or damage due to unexpected electrical failures.

Other Measures

Besides the above-mentioned measures, user can also adopt the following practices to mitigate the likelihood of electrocution and fire incidents involving electrical systems:

- Do not overload your electrical sockets.
- Conduct a safety test for electrical equipment at least once a year.
- Fire extinguishers, including carbon dioxide or dry powder types, should be placed at vantage points for in readiness for electrical fires.
- Fire exits should be clearly marked out, and free from clutter.
- Drink should not be consumed near electrical equipment since spillages could result in short circuiting in the electrical components.
- Leave adequate space on all vented sides of the computer to permit the required airflow for proper ventilation.
- Secure all signal and electrical cables in trunks or elevated positions beyond reach of passersby.
- Protect all sockets from being soaked with water and other fluids.
- Wear safety clothes where necessary.

NOTE: Figure 5.16 below shows a summary of some safety tips regarding installations and uses of electrical and electronic systems or devices:



PHYSICAL SAFETY
ELECTRICAL/FIRE HAZARDS

Faulty kit can cost you your life; Shocking.

- ❖ Make sure the kit you are using is PAT tested (Portable Appliance Test)
 - ❖ Don't overload sockets with a lot of plugged appliances
 - ❖ Don't get water close to machines!
 - ❖ Keep computer gear well ventilated
- ❖ Use appropriate fire-extinguishers (e.g. CO2, Powder)
 - ❖ Observe any health and safety notices
- ❖ Don't buy dodgy computer kits - only get it from reputable companies.
 - ❖ Don't block the fire exit.

Figure 5.16: Some Safety Advice

Activity 5.16: A Field Trip to an IT Firm Or Electricity Company

In this activity, your teacher will arrange for you to embark on a field trip to a nearest IT firm or Electricity company to observe and interview the relevant personnel with respect to the hazards posed to workers as well as customers due to the placement or layout of electrical cables, usage of electrical devices, as well as how they control or mitigate these hazards.

If your teacher is unable to arrange for you to visit an office, then please watch the following YouTube video and complete the activity.

Video - [This Epic Studio Tour Almost Killed Me!! \(youtube.com\)](https://www.youtube.com/watch?v=...)

On return,

1. Write your observations from the trip
2. Discuss your written observations with peers
3. After peer discussion, use MS Word to produce a writeup on:
4. Causes, effects and prevention or mitigation of Electrocutation and fire.
5. Causes, effects and prevention or mitigation of Trip and fall
6. Present your findings to the class for verification by your facilitator

7. Compare and contrast your individual findings and finally produce a single document for publication on the school's notice board

NOTE: Use the Internet for further information where necessary

Activity 5.17: Creating a Concept Map on the Topic “Ensuring Physical Safety when Using Digital Devices”, Using Graphics (Images).

Use pictures or sketches illustrating the **Dos** and **Don'ts** that ensure safety in an office, lab or home and create a concept map from it. Checkmarks should be put on the **Dos** while the **Don'ts** are crossed out. The pictures or sketches should be arranged or connected to a circular centre labelled, “Ensuring Physical Safety when Using Digital Devices”.

Instructions:

1. You may sketch your personal images or search the Internet for relevant pictures depicting the given factors.
2. Assuming you are using the Internet, do the following:
 - i. With your device connected, open the home page of a search engine provider of your choice (e.g. Google.com) in your browser and search for related images by typing a given “**Dos**” or “**Don'ts**” in the search box and press enter.
 - ii. Following the hyperlinks to locate the most appropriate image and download it for use in your concept map.
 - iii. Repeat the process until you obtain the matching images for all your points.
 - iv. You may use MS Paint, Visio, Publisher, or Word to create your concept map.

NOTE: Your concept map should look like the sample shown in **Figure 5.15**

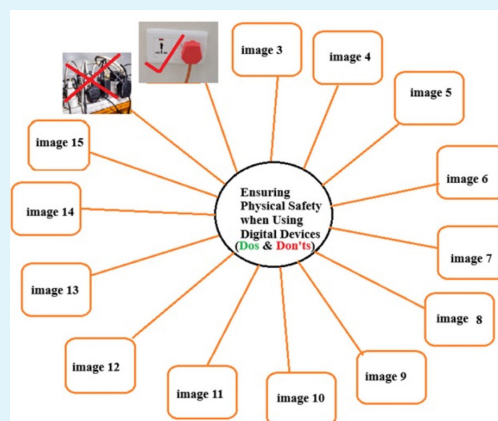


Figure 5.17: Concept Map of Dos and Don'ts in Electrical Environment

Activity 5.18: Creating a poster of dos and don'ts to prevent trip and fall and electrocution and fire risks in the school lab or home.

In this activity you are to create a poster highlighting the Dos and Don'ts as a guide to prevent trip and fall and electrocution and fire risks in the school lab or home. Initially, you are to create individual posters. After that you compare your outputs, looking out for similarities and differences, and eventually create one document using MS Word for posting in the school lab and other relevant locations within the school.

Materials needed: A4 papers (for drafting of writeup), and a computer with MS word or any suitable application installed (for digitisation of the paper-based draft).

Steps:

1. Write the dos and don'ts to prevent trip and fall and electrocution and fire risks.
2. Use MS Word or any suitable application to design your poster with the written notes in step 1 (Your poster should have "Key Electrical Safety Tips" as the title.)
3. Compare your output with that of your peers looking out for similarities and differences with the Dos and Don'ts stated in their posters.
4. Make necessary corrections in your work after comparison if any.
5. Create a master or single poster from your individual ones and post it in the school lab and other relevant locations within the school.
6. Add your individual posters to your portfolios, after verification by your ICT facilitator.

Activity 5.19: Reflective Exercise on Trip and Fall Risks and Electrocution and Fire Risks

In this activity, you are to reflect individually on what you have studied so far with respect to **trip and fall risks** and **electrocution and fire risks**.

Instructions:

- a. Write down five facts that you have learned about physical safety issues in ICT environments over the past four weeks.
- b. Present to the rest of the class or group members the advice you would offer to the general public based on what you have learnt, given the opportunity

Review Questions

1. Imagine you need to set up a perfect workspace for someone who uses a computer a lot. How would you arrange the desk, chair, and computer to help prevent RSI? Describe each part of your design and explain how it helps avoid RSI.
2. Create an action plan for a company with many employees experiencing musculoskeletal problems from computer use. Your plan should include steps for;
 - a. improving workspace ergonomics, training employees and checking how well your plan is working.
 - b. how each part of your plan will help prevent these problems.
 - c. how you will measure if the plan is successful.
3. Describe the ergonomic setup shown in Figure 5.2. The first element has been completed for you.

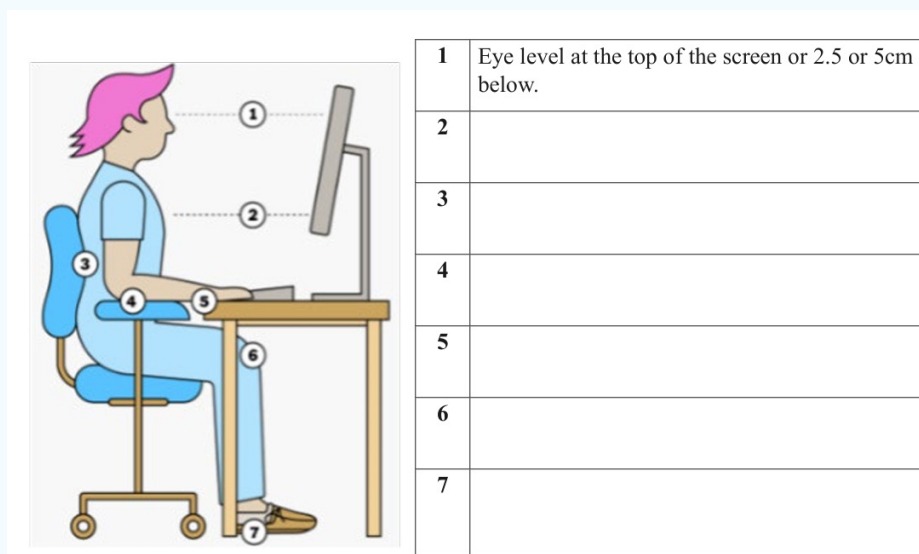


Figure 5.18: Ergonomic Setup

4. If you were a health educator, what things would you need to consider to design a workshop programme for students to raise awareness about the following computer-related health conditions – eye strain, headaches and vertigo.
5. Develop an educational flyer that can be used to promote healthy computer habits and prevent headaches, migraines and vertigo in computer users. Use computer software for your design.
6. Design a guide for what an ergonomic workstation setup that addresses eye strain would look like.

7. Millicent is a 35-year-old office worker who suffers from eye strain and RSI. Discuss the long-term effects that these conditions may have on her overall health.
8. Your friend confides in you that they struggle to fall asleep and often spend hours late at night scrolling through social media on their phone. They also mention feeling particularly anxious and not sleeping well. How would you offer advice and support to help your friend through this situation?
9. How does stress from using computers contribute to the development of depression and anxiety? Explain the connections between computer use, stress, and these mental health issues.
10. How can exposure to blue light affect the quality of your sleep? Discuss the mechanisms through which blue light influences sleep patterns and overall sleep quality.
11. Study **Figure 5.19** carefully
 - a. Identify any hazards that you see
 - b. Explain the possible accidents or health issues that could result from these hazards.



Figure 5.19: A typical ICT office setting.

12. Use MS word to design a risk assessment form for classrooms in your school and complete the designed form for your classroom (lab).
13. The Figure 5.20 shows five types of fire extinguishers in terms of substances used. Tick the corresponding box at the bottom for fire extinguisher(s) that would be suitable for use with an electrical fire outbreak.

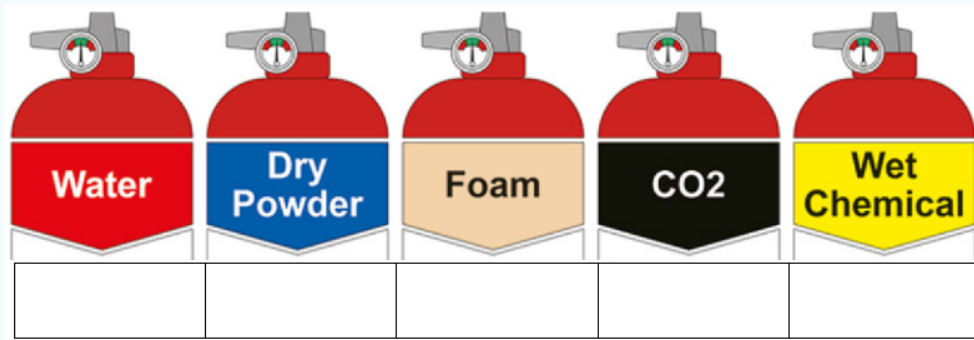


Figure 5.20: Types of Fire Extinguishers.

14. Identify the health and safety hazard posed by the **Figure 5.21** below and describe the possible result of this hazard.



Figure 5.21: Faulty Electrical Cable

Extended reading

1. Note: Read more on <https://www.verywellhealth.com/is-working-at-my-com>
2. An interesting article entitled ‘Gamers at risk of irreversible hearing loss and tinnitus, study suggests’ can be found at: <https://www.bbc.co.uk/news/technology-68004968>.
3. <https://www.betterhealth.vic.gov.au/health/healthy>
4. What the Science Says about: Children’s Digital Media Use, Depression and Anxiety - <https://www.youtube.com/watch?v=6T0ditpA3Sg>
5. Create your own quiz on what you have studied in this section: <https://kahoot.com> or <https://quizlet.com>
6. Thiele T. and Campbell L. (2021) Why You Should Avoid Using Plug Adapters. <https://www.thespruce.com/why-not-to-use-plug-adapters-1152432>
7. <https://www.betterhealth.vic.gov.au/health/healthyliving/computer-related-injuries>

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4. Vermaat, M., E., Sebok, S., L., & Freund, S., M. (2014). Discovering Computers: Technology in a World of Computers, Mobile Devices, and the Internet, Course Technology, Cengage Learning
5. **Image Address (figure 5.12):** [https://www.lifewire.com/thmb/nrB-3fo-ny05FQTFoLdYEjr1VG0=/750x0/filters:no_upscale\(\):max_bytes\(15000\):strip_icc\(\):format\(webp\)/A3-TurnOffBlueLightoniPhone-annotated-0bfb85a0f17d4ef5a0380640946a6cac.jpg](https://www.lifewire.com/thmb/nrB-3fo-ny05FQTFoLdYEjr1VG0=/750x0/filters:no_upscale():max_bytes(15000):strip_icc():format(webp)/A3-TurnOffBlueLightoniPhone-annotated-0bfb85a0f17d4ef5a0380640946a6cac.jpg)
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Glossary

1. **Screen-time:** It refers to time spent looking at computing devices
2. **Ergonomic:** refers to designing things like workspaces, tools, and furniture to make them comfortable and easy to use.
3. **Musculoskeletal:** Refers to the parts of the body that help you move and stay upright, including muscles, bones, and the connections between them.
4. **Strain:** refers to the physical stress or pressure put on your muscles, tendons, or other parts of your body.

5. **Ambient lighting:** is the general, overall light in a room or space. It's the soft, even light that helps to create a comfortable environment without any harsh shadows or bright spots.
6. **Anti—glare:** refers to a coating or feature that reduces the amount of light reflecting off a surface, like a screen or glasses, so it's easier to see and less straining on the eyes.
7. **Cybersickness:** is when you feel dizzy, nauseous, or unwell after spending a lot of time on screens or using virtual reality.
8. **Ergonomic:** means designed to be comfortable and efficient for people to use. For example, an ergonomic chair is made to support your body properly and reduce strain while you sit.
9. **Headache:** is when you feel pain or discomfort in your head or neck. It can feel like a dull ache or a sharp pain, and it might make it hard to focus or do things.
10. **Flicking:** means making a quick, sharp movement with your finger or hand, often to get something to move or change direction. For example, flicking a light switch turns the light on or off with a quick motion.
11. **Optimise:** means to make something as effective or efficient as possible. For example, if you optimise a process, you adjust it to get the best results with the least amount of effort or resources.
12. **Vertigo:** is a feeling of spinning or dizziness, as if you or your surroundings are moving when they are not. It's often caused by problems with the inner ear or the brain.
13. **Insomnia:** Trouble falling or staying asleep.
14. **Depression:** Ongoing feelings of sadness and lack of interest.
15. **Anxiety:** Excessive worry or fear.
16. **Melatonin:** A hormone that regulates sleep.
17. **Cyberbullying:** Online harassment or bullying.
18. **Exacerbate:** Make something worse, especially a problem or negative situation.
19. **Electrocution:** Electrocution is death or severe injury due to electric shock from electric current passing through the body
20. **Residual Circuit Device (RCD):** Residual current device (RCD), is a life-saving device which is designed to prevent you from getting a fatal electric shock if you touch something live, such as a bare wire. It can also provide some protection against electrical fires.

Acknowledgements



Ghana Education
Service (GES)



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