

Equipment Care

YOU CAN PROLONG the life and performance of your laptop or personal computer with proper care. You will increase its speed and longevity by using the right cleaning equipment. Therefore, learning how to avoid electrostatic and thermal stress on your equipment is important. In addition, maintaining a clean work area with no food or drinks around your computer is essential.



Objectives:



1. Describe best practices for computer and peripheral care.
2. Describe guidelines and supplies used for cleaning equipment.
3. Explain methods for keeping software and operating systems running optimally.

Key Terms:



antistatic mat

best practices

electrostatic discharge

spyware

surge protectors

thermal stress

uninterruptible power

supplies

virus

zero potential

Best Computer Maintenance Practices

Best practices are guidelines for the care of your computer and peripheral equipment. Your equipment should be kept out of direct sunlight. Long exposure to direct sunlight or intense heat can melt components and cause structural damage, causing your equipment to stop working.

Electronic equipment should be kept in a room where the temperature ranges from 60° to 75° Fahrenheit. When you receive new equipment by mail, especially in winter temperatures, let it adjust to room temperature before it is used. If electronic equipment has been cold, it may create condensation when it warms up. Irreparable damage can be caused if electronic

equipment has internal condensation. To prevent damage, allow the condensation to evaporate before use.

CONSIDERATIONS ABOUT RUNNING COMPUTERS 24/7

There is debate about the wisdom of leaving your computer running 24 hours, seven days a week. **Thermal stress** is the expanding and contracting of electronic equipment as it is heated and cooled. Expansion and cooling cycles are avoided by leaving the equipment on around the clock. By reducing thermal stress, you will prolong the computer's lifespan. But if air conditioning is turned up at night to conserve energy, and temperatures reach as high as 80°F, your computer will become too hot. In that situation, it is best to shut down computers overnight.

More power is consumed if computers are left running 24/7 and components, especially monitors, will wear out faster. For desktop towers, the CPU can be left on, but monitors should be turned off overnight.

STORAGE OF EQUIPMENT NOT IN USE

To avoid the collection of dust and environmental particles, equipment not in use for long periods of time should be covered. Dust that accumulates in a computer can reduce the air ventilation that keeps it from overheating. It is always better to close or pack a laptop in a carry case when it is not in use. It is also important to cover the printer, scanner, and other peripherals to keep them free of dust.

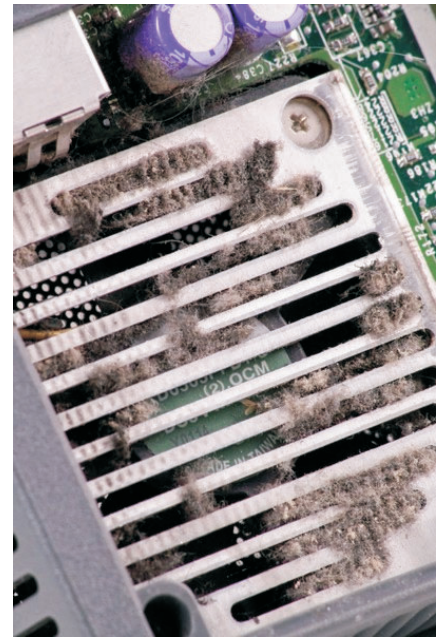


FIGURE 1. Keep equipment covered when not in use for a period of time to keep dust and dirt from accumulating.

POWER ISSUES

Equipment should be plugged in whenever possible to maintain a battery charge. It is wise to plug your computer into a surge protector rather than directly into an electrical outlet. **Surge protectors** are devices that protect electronic equipment from being damaged by voltage spikes during storms or power outages. However, during a storm when lightning strikes nearby, it is best to unplug electronics, as many surge protectors may not protect against intense lightning strikes.



FIGURE 2. Surge protectors protect electronic equipment from some voltage spikes.



BROADENING AWARENESS...

AMAZING ASPECTS: Underwriters Laboratories

Underwriters Laboratories Inc. (UL) is an independent product safety certification organization. It has no affiliation with any brand, product, or company and is not-for-profit. UL was founded in 1894 by William Merrill and has its company headquarters in Northbrook, Illinois. It sets standards and test procedures to verify, validate, and inspect billions of everyday products, materials, components, tools, and equipment.

Products are periodically checked by UL at manufacturing facilities to verify that they continue to meet UL requirements. Products that successfully navigate UL stringent tests are registered with the lab and can bear the UL mark—a widely trusted symbol for product safety and quality. Nearly 20 billion products from 72,000 manufacturers earn the UL symbol each year in North America, Asia, and Europe.

Uninterruptible power supplies (UPS) are devices that protect against power fluctuations and outages by providing temporary battery energy when the power goes out. UPS can help maintain a job in progress, save data, or complete a printing or copying job in spite of a power outage. It is important to ensure that uninterruptible power supplies are “Underwriters Laboratory (UL) Approved.”

When you replace computer batteries, printer ink, copier toner, or other consumable products, it is essential to use the correct replacement product and to read the instructions in the owner’s manual before replacement. Using the wrong replacement part can cause damage. For example, some batteries may catch on fire or explode if placed in the wrong device.

Food, liquids, and smoke are all potential hazards for electronics. Food particles can slip into the keyboard and disperse into the electric circuitry. Meanwhile, liquids can spill and damage your computer and components. Smoke can layer and “gum up” internal microprocessor circuitry and cause malfunctions. Also, smoke damage to computer equipment may negate the warranty.



FIGURE 3. When you replace computer batteries, printer ink, copier toner, and other consumable products, always use the correct replacement parts.

Guidelines and Supplies to Clean Equipment

Personal and equipment safety are important when cleaning electronic equipment. So you should be aware of safety precautions and know how to properly maintain your equipment.

SAFETY TIPS

The following tips are designed to keep people from being electrocuted and to keep the equipment from being damaged from electrostatic discharge and from inappropriate fluids and chemicals.

- ◆ Electronics should be turned off and unplugged before you clean them.
- ◆ Liquid should not be sprayed or squirted onto computer parts. If a fluid chemical is used, it should be sprayed onto a cloth, and the cloth should be used to wipe the computer parts. Fluid chemicals can damage your LCD monitor, keyboard, and other computer parts. As a result, only water or diluted chemicals should be used.
- ◆ Vacuum dirt, dust, and/or hair from around the computer and the outside case. These items may restrict airflow and could cause the circuitry to corrode.
- ◆ Using a vacuum or spraying compressed air to clean a fan may cause damage or back voltage. When cleaning fans, especially smaller fans in portable computers, the fans should be held in place to prevent them from spinning.

CLEANING SUPPLIES

Specialized electronic and computer cleaning supplies can be purchased, but common household supplies will usually suffice.

- ◆ A non-lint cloth is suggested to clean the exterior casing, drives, mouse, and keyboard. A cloth should not be used to clean internal parts (e.g., the RAM or motherboard) because the cloth can generate a destructive electrostatic discharge. An **electrostatic discharge** is a small transferring of electricity from a person's body to an object, similar to what happens when you rub your feet across a carpet and then touch something that conducts electricity.
- ◆ Use water or rubbing alcohol to moisten a cloth. Other solvents may cause damage.
- ◆ If the inside of your computer needs vacuuming, use a small, portable battery-powered vacuum made for computers, or use compressed air to blow out dust. Plug-in vacuums create an electrostatic discharge that could damage your equipment.
- ◆ Cotton swabs are good tools for wiping hard-to-reach areas in a keyboard, mouse, and casing.
- ◆ If you use foam swabs, use only a lint-free variety.

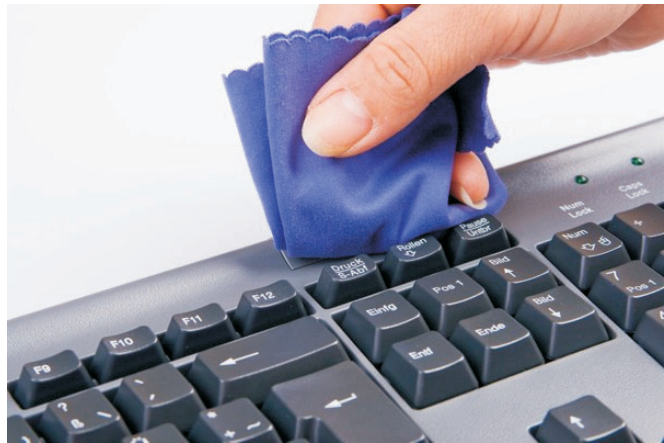


FIGURE 4. A non-lint cloth is suggested when cleaning your exterior casing, drives, mouse, and keyboard.

ELECTROSTATIC DISCHARGE

Specific steps can be taken to minimize electrostatic discharge that can ruin electronic circuitry.

- ◆ Use an antistatic mat or gloves when working on small equipment. An **antistatic mat** is an item made of nonconductive materials that reduces the risk of electrostatic discharge when working with sensitive equipment.
- ◆ It is critical to create “zero potential” by always touching an unpainted metal surface of the equipment or power supply case. **Zero potential** is a condition in which there is no potential for generating electrostatic discharge.
- ◆ Sitting on a chair can generate more electrostatic discharges, so standing is recommended when you work on small equipment.
- ◆ Unplug all cords and peripherals from the computer to reduce the chance of electrostatic discharge.
- ◆ Avoid wearing highly conductive clothing, such as wool.
- ◆ Electrical storms increase the risk of electrostatic discharge, so avoid working on a computer during an electrical storm.
- ◆ To reduce the risk of electrostatic discharge, remove all jewelry.

Keeping Software and Operating Systems Running

You should employ methods to maintain computer health and productivity. Using antivirus software for scanning and cleaning spyware and viruses is a basic method for routinely protecting your computer. A **virus** is a malicious programming code injected into a computer to cause dysfunction. Also, protect your computer from **spyware**, which is a device that secretly collects personal information and activities of a user without the user’s permission.

DISK SPACE

Your computer performance will be improved if you periodically free up hard disk space. In Windows, the path to Disk Cleanup is through All Programs, Accessories, and System Tools. Disk Cleanup does the following:

- ◆ It removes temporary Internet files.
- ◆ It deletes unneeded program files that have been downloaded.
- ◆ It empties the Recycle Bin.
- ◆ It removes temporary files (e.g., Windows error reports).

- ◆ It deletes unused and optional Windows components.
- ◆ It deletes installed programs that are not being used.

DISK DEFRAGMENTER

The Disk Defragmenter tool is necessary for good computer maintenance. Fragmentation occurs over time as you save, change, and delete files. Changes you save to a file are often stored in a separate location, away from the original file on the hard disk. When the file becomes divided into pieces scattered around the disk, the files are fragmented. As a result, the computer slows down noticeably because it must look in many places to open a file. Disk Defragmenter is a tool that puts fragmented files back together on the computer's hard drive. In Windows, the path to Defragmenter is through All Programs, Accessories, and System Tools. You should use it as follows:

- ◆ Weekly
- ◆ When adding a large number of files
- ◆ When free disk space totals 15 percent or less
- ◆ When new programs or a new operating system is installed

ERROR CHECKING TOOL

Use the Error Checking tool because the hard drive can develop bad sectors that slow performance and create dysfunction when saving work. The Error Checking tool finds bad sectors and scans for file system errors. For computers used daily, the Error Checking tool should be used once a week.

SYSTEM RESTORE

The System Restore tool is also important. The computer automatically creates restore points as it is used. If programs have been erased accidentally, using the system restore is one method of retrieving them. In Windows, the path to System Restore is found through All Programs, Accessories, and System Tools.

Summary:



Best practices are guidelines for the care of your computer and peripheral equipment. Your equipment should be kept out of direct sunlight, and the temperature should range between 60° and 75° Fahrenheit. Room temperature and thermal stress must be considered in making decisions to leave your computer on 24/7.

Equipment should be plugged in whenever possible to maintain a battery charge, but it should always be plugged into a surge protector to protect it from power outages or voltage spikes. Uninterruptible power supplies are devices that protect against power fluctuations and outages by providing temporary battery energy when the power goes out.

Cleaning your equipment properly is very important, and you must remember to unplug your computer before you clean it. Performing a disk cleanup will help protect your system from spyware and viruses. In addition, regularly using your disk defragmenter tool will put fragmented files back together on the computer's hard drive and improve its speed and operation.

Checking Your Knowledge:



1. What are the optimal light and temperature conditions for your computer's life and performance?
2. How can leaving your computer on 24/7 create thermal stress?
3. Explain how dust can harm computer equipment.
4. When are surge protectors important?
5. Why is the disk defragmenter extremely important?

Expanding Your Knowledge:



Study your computer manual to learn what tools your equipment has to protect machinery and software from viruses, fragmentation, and disk restoration. Are there other ways you can maintain your equipment to prolong its life? Make a list and a schedule to help maintain your computer.

Web Links:



Spyware

<http://www.microsoft.com/security/pc-security/spyware-what-is.aspx>

Computer: On or Off?

<http://pcguide.com/care/care/gen/powerOnOff-c.html>

Computer Viruses

<http://www.howstuffworks.com/virus.htm>