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Computer Systems & Application

Safety and Environment Issues

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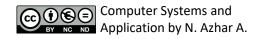### nazhar@ump.edu.my

Communitising Technology

Chapter Description

- **Aims**
  - Understand the important of safety and environment issues.
- **Expected Outcomes**
  - Learner's knows how to recycle computer peripherals
  - Leaner's aware some toxic materials lies in computer peripherals

- **Other related Information**
  - Computer Recycling Guide
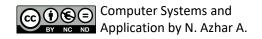 - Environment and Safety, Tokyo Institute of Technology OCW

- **References**
  - Health, safety and environment test: for operatives (BSL) and specialists. 2014. London?: CITB.
  - Recycling electronics: a common sense solution for enhancing government efficiency and protecting our environment: hearing before the Committee on Homeland Security and Governmental Affairs, United States Senate, One Hundred Thirteenth Congress, second session, February 27, 2014. 2016. Washington: U.S. Government Publishing Office.
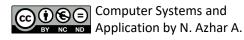
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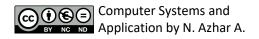
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Introduction

- Known also as e-waste, where malfunction computer peripheral will be discard
- UN's Environment Programme alarmed the wastage increasing significantly over the year
- Some material inside the computer such as lead could harm human after exposure
- Everybody should aware about this matters since it will be more than 100 years (non biodegradable) in solid state
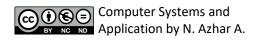
Harmful Things in Computer

- Polyvinyl Chlorides (PVC)
  - Can release dioxins when incinerated which can cause cancer

- Phthalate (EPA)
  - Can cause damage to liver and testis from long time exposure

Recycling Computer in Industry

1. Sorted various valuable elements of electronic waste, including gold, copper, silver and plastic from CRTs, ink cartridges, cables, circuit boards, and countless other pieces of waste.

2. Workers burn circuit boards, burn microchips, dip circuit boards and electric cables into large tubs of acid which is a mixture of pure nitric acid and hydrochloric acid to extract computer chips, copper and gold respectively.

3. Plastics - can be cut, washed, dried, and then crushed into a powder and melted into long tubes that can be sold to factories if they are properly sorted by type and color.

4. PVC coated wires are also often burned to a powdery ash to expose the copper within. The PVC powder is discarded. Burning plastics releases fumes of PVCs and PAHs (polycyclic aromatic hydrocarbons).

5. Ink cartridges are taken apart by hand and workers use small brushes to sweep out the ink and toner, inhaling clouds of chemical vapor and carbon black particles.
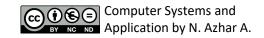
LCD Monitors Recycling

- computer monitor or display that uses LCD technology to show clear images, and is found mostly in laptop computers and flat panel monitors.

- Recycling method
  - Repairing LCD Monitors
  - Refurbishing LCD Monitors
  - LCD Monitors disposal

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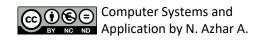 https://pixabay.com/en/lcd-monitor-screen-high-definition-32872/

Phone Recycling

- Recycling method
  - Sell phone for cash
  - Donate to Soldiers
  - Trade for the new phone
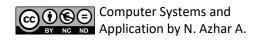 - Donate for charities

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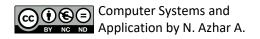
Clearing Personal Data in Hard Drive

1. Back up files or data you want to keep

2. Use Data Destruction Software / Programs
   - DBAN (Darik's Boot and Nuke)
   - CBL Data Shredder
   - HDShredder Free Edition
   - HDDErase
   - MHDD
   - PCDiskEraser
   - KillDisk

Conclusion

In this topic you have learned

- how to recycle computer peripherals in the good way with the knowledge of environmental safety

- to know some toxic materials lies in computer peripherals such as lead

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