

E-Waste: Causes and Effects on Environment

E-waste or Electronic pollution is a growing environmental issue as the rapid advancement of technology has led to a significant increase in the production of various electronic devices.

Pollution is the presence of harmful substances in the environment that causes an adverse,degrades the quality of the environment.

Improper disposal of E-waste can lead to harmful effects on Human health and the overall environment.

What is E-Waste?

E-waste stands for electronic waste which is defined as electronic devices that are discarded such as computers, TVs, smartphones, and other electronic equipment. E-waste elements contain toxic substances such as mercury, beryllium, lead, and cadmium.

- a) Electronic-Waste (E-Waste) describes **abandoned electronic appliances**. It contains all of their parts, consumables, and spares.
- b) Informal or uncontrolled e-waste processing, particularly in developing countries, can be harmful to **human health** and pollute the **environment**.

Causes of E-Waste Pollution

Rapid Innovation in Technology: Due to the increase in technological and industrial demand new electronic devices have developed that result in unwanted and unused devices are not used and properly disposed of which leads to e-waste pollution.

Rising demand for electronic products: The rise in new electronic products indirectly leads to an increase in e-waste pollution.

Lack of Reparability: Electronic devices go through many damages and breaks becomes of no use in the future if not repaired or not replaced by the new one.

Illegal E-waste Trade: Illegal trade of e-waste is increasing e-waste pollution. Many business companies and traders export and import e-waste

from and to the countries and the same e-waste is being reused and recycled again by using unsafe and illegal processes.

Electronic Gadgets that cause E-waste

E-waste pollution is caused due to improper disposal and recycling of electronic gadgets such as:

- Smartphones
- Computers and Laptops
- Printers
- Televisions
- Peripheral devices such as mouse, keyboards
- Speakers and headphones
- Electronic toys
- Batteries and cells
- Washing machines, Refrigerators
- MRI Scanners and X-ray machines
- Cameras
- Pendrives and DVDs
- Chargers

Particulars	Sources	Health Effects
Lead	<ul style="list-style-type: none">• Used in computer monitor gaskets and glass panels.• Solder components and printed circuit boards.	<ul style="list-style-type: none">• Humans' central and peripheral nervous systems, circulatory systems, kidneys, and reproductive systems are all affected by lead.• It also has an impact on the endocrine system and impedes brain development in children.
Cadmium	<ul style="list-style-type: none">• SMD chip resistors, infrared detectors, and semiconductor chips all contain it.• Cadmium is included in certain older cathode ray tubes.	<ul style="list-style-type: none">• Cadmium molecules that are toxic accumulate in the human body, particularly in the kidneys.
Mercury	<ul style="list-style-type: none">• Electrical and electronic equipment is projected to account for 22% of global mercury consumption each year.• Thermostats, sensors, relays, switches, medical equipment, lamps, mobile phones,	<ul style="list-style-type: none">• Mercury can harm organs such as the brain and kidneys, as well as the developing foetus.• When inorganic mercury dissolves in water, it is converted to dimethyl mercury, which bioaccumulates in living species and concentrates through the food chain, especially through fish.

	<p>and batteries all contain mercury.</p> <ul style="list-style-type: none"> • Mercury use in flat panel displays is expected to rise as cathode ray tubes are phased out. 	
Hexavalent Chromium/ Chromium VI 29	<ul style="list-style-type: none"> • Chromium VI is used to protect untreated and galvanized steel plates from corrosion, as well as to decorate and harden steel housings. PVC (and other plastics). • When PVC is burned, dioxin is emitted. • Cable and computer housings contain PVC components. 	<ul style="list-style-type: none"> • Chromium VI is particularly hazardous in the environment and can destroy DNA.
Barium	<ul style="list-style-type: none"> • Barium is a soft silvery-white metal that is used in computers to protect users from radiation in the front panel of a CRT. 	<ul style="list-style-type: none"> • Short-term barium exposure causes brain enlargement, muscle weakness, and heart, liver, and spleen damage, according to studies.
Beryllium	<ul style="list-style-type: none"> • Beryllium can be found on many motherboards and finger clips. • It's a copper-beryllium alloy that keeps electrical conductivity while strengthening connections and tinyplugs. 	<ul style="list-style-type: none"> • Lung cancer can be caused by beryllium exposure. • Beryllium also produces a skin condition marked by slow wound healing and wartlike lumps. • People can develop beryllium disease many years after their last exposure, according to studies.
Toners	<ul style="list-style-type: none"> • Found in the black and colour toner cartridges of a plastic printer cartridge. 	<ul style="list-style-type: none"> • The principal route of exposure is inhalation, and acute exposure can cause respiratory tract irritation. • Carbon black is recognised as a class 2B carcinogen that may cause cancer in humans. • Heavy metals have been found in colour toners (cyan, magenta, and yellow), according to reports.

Phosphor and additives

- Phosphor is an inorganic chemical compound that is placed to the inside of the CRT faceplate as a coat.
 - Heavy metals, such as cadmium, and other rare earth metals, such as zinc and vanadium, are used as additions in the phosphor coating on cathode ray tubes.
 - These metals, as well as their derivatives, are extremely dangerous.
 - For those who deconstruct CRTs by hand, this is a severe risk.
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