



Thematic Sheet 6/6

ELECTRONIC WASTE

Sec. I and II

Eduki Competition 2025/2026

- Interconnected : human – digital – sustainable

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F) ELECTRONIC WASTE

Accumulation, pollution, planned obsolescence, recycling, circular economy.

INTRODUCTION TO THE TOPIC

The widespread use of digital devices is leading to a growing production of electronic waste – computers, smartphones, batteries, and cables – with global volumes increasing every year. This e-waste contains both valuable, reusable materials such as gold, copper, cobalt, and rare earths, and toxic substances like mercury and lead. If poorly handled, it poses a major risk to both the environment and human health. While recycling offers opportunities to recover rare resources and reduce dependence on imports, a large portion of this waste still escapes formal collection systems and ends up being incinerated, stored, or exported to countries with lower environmental standards.

The aim here is to explore the **current limitations of the electronic waste management system** and to consider **sustainable solutions**: improved collection, eco-design, extending the lifespan of devices, and developing a true circular economy for the digital sector.

TO START THE DEBATE

This sub-theme can be approached from different angles. Here are some possible directions:

→ **Accumulation and pollution :**

- How much electronic waste is produced globally each year, and what percentage is actually recycled? What happens to the e-waste that is not collected – is it landfilled, incinerated, or exported to other countries?
- What health and environmental risks are posed by the toxic substances found in this waste, such as mercury, lead, or plastics?
- Does the accumulation of e-waste threaten biodiversity as well as water and soil resources in areas where it is illegally stored or processed?

→ **Planned obsolescence:**

- Do manufacturers deliberately design devices with a limited lifespan to boost consumption? To what extent do software updates, non-replaceable batteries, or soldered components contribute to this obsolescence?

- Can public policies, such as the right to repair, sustainability labels, or extended warranties, help reduce this phenomenon?
- How can we raise awareness among citizens to make more responsible and sustainable purchasing choices, despite the appeal of new technology?

→ **Recycling and circular economy:**

- Is it possible to efficiently and effectively extract rare and valuable materials like gold, copper, cobalt, or rare earth elements from electronic waste?
- Why is only a small proportion of global e-waste processed through formal recycling systems?
- How can we develop a true circular digital economy, including repair, reuse, sharing, and extending the lifespan of devices?

SOME KEY STATISTICS

- Global electronic waste production reached 62 million tons in 2022, about 7.8 kg per person, representing an 82% increase since 2010. Of this waste, only 22.3% was officially collected and recycled. The material value of this e-waste is estimated at 91 billion USD, but only 30% of that potential is actually recovered through recycling ([Geneva environment network, 2024](#)).
- In Switzerland, according to SENS eRecycling, each citizen generated an average of 11.14 kg of electronic waste in 2023, for a total of approximately 100,762 tons collected ([Sens eRecycling, 2023](#)).
- Switzerland is one of the top performers worldwide in electronic waste recycling, with a recovery rate exceeding 90% ([ETH CSS, 2023](#)).
- However, in 2019, only 17.4% of the world's electronic waste was properly collected and recycled. The rest was undocumented or processed informally, leading to significant health and environmental consequences ([NRDC, 2020](#)).
- In 2022, recycling helped avoid the extraction of nearly 900 million tons of primary ores and reduced CO₂ equivalent emissions by 93 million tons ([UNITAR, 2024](#)).
- Finally, a report indicates that if collection and recycling rates reached 60% by 2030, the economic benefits would exceed the recycling costs by nearly 38 billion dollars, while also including savings on human health and environmental protection ([UNITAR E-Waste Monitor, 2024](#)).

However, digital technology can also play a positive role in the recycling of electronic waste.

... And your students, what do they think?

DID YOU KNOW? (CASE STUDY)

Innovate to protect: Living in a Dump

→ An example of the negative consequences caused by electronic waste

Agbogbloshie, a vast district of Accra, the capital of **Ghana**, was long known as the largest electronic waste dump in Africa, and possibly the world. Every year, thousands of tons of used devices, mainly imported from Europe and North America, were piled up, dismantled, and then burned to extract valuable metals such as copper and aluminum. This informal activity provided livelihoods for several thousand people, including children. However, working conditions were extremely precarious: workers were constantly exposed to toxic fumes containing dioxins and lead, causing respiratory diseases, neurological disorders, and chronic blood contamination. The local environment was also severely damaged, with lasting pollution of the soil, air, and water of the nearby Korle Lagoon. In 2021, the Ghanaian government dismantled these facilities to allow for urban rehabilitation of the site.

SOME NON-EXHAUSTIVE PROJECT IDEAS

CATEGORY: ARTWORK

Project idea	Description
Sculptures – « <i>New Life for Electronic Waste</i> »	Organize a workshop where participants collect electronic waste to create artworks or installations.
Mosaic – « <i>Electronic Waste as Art</i> »	Create a mosaic made from electronic waste.
Portraits – «<i>humans/ machines</i> »	Draw portraits imagining a symbiosis between humans and electronic devices
Theater – «<i>Accumulation</i> »	A theatrical performance exploring the theme of accumulation of electronic devices.
Digital illustration– « <i>Planned obsolescence</i> »	Digital illustrations exploring the theme of planned obsolescence from various perspectives.

CATEGORY: MEDIA CREATION

Project idea	Description
Video – «<i>Informational Series on Electronic Waste Recycling</i>»	Create a series of multimedia content explaining the issues related to electronic waste.
Website– «<i>What is the Ecological Impact of Devices? »</i>	Users can visualize the ecological impact of each type of electronic waste.

Podcast – <i>What If We Explored Alternatives to Waste?</i> »	A podcast that questions alternatives to the systematic acquisition of digital devices.
Street interviews– «<i>How Do You Manage Your Digital Devices?</i> »	A survey investigating how people use and manage their digital devices.

CATEGORY: CONCRETE ACTION

Project idea	Description
Awareness Campaign	Possible themes: pollution, accumulation, recycling, planned obsolescence
Repair Workshop	Repair of all brought-in digital devices
Charter for Responsible Recycling	Developed collaboratively; displayed in the classroom or shared within the school
Peer Exchange Space	Regular discussions about digital usage, pollution, emotions, etc.

DRAW IDEAS FROM PREVIOUS WINNERS OR OTHER EXISTING PROJECTS

- « For some a waste, for some a daily save » - Muttentz High School (BL)

USEFUL RESOURCES

WEBSITES

Title	Description
Electrical and electronic devices Link	Instructions for responsible recycling (in French).
Electrical and electronic equipment Link	Electrical and electronic equipment are multiplying, while their usage lifespan is decreasing. This dynamic leads to a continuous increase in electronic waste. It is essential to handle these wastes properly to prevent the release of pollutants into the environment and to promote the recovery of materials at the end of their life cycle.

PRESS ARTICLES

Title	Description
Nearly 90,000 tons of electronic waste collected in Switzerland Link	In 2024, the private foundation SENS collected 89,960 tons of electronic waste through its take-back system. End-of-life devices were dismantled, valuable materials recovered, and toxic components disposed of according to environmental standards.
Switzerland takes action against e-waste Link	This week in Bali, Indonesia, the 9th Conference of the Parties to the Basel Convention on Waste is taking place. The main theme is the environmentally sound disposal of electronic devices and waste in emerging countries.

EDUCATIONAL RESOURCES

Title	Description
Repair Café Link	Customers bring broken devices, and apprentices assist them with troubleshooting by providing technical skills and the necessary tools. Customers must register in advance.
The real life of our waste Let's change, let's act! Link	The State of Geneva offers an educational project (in french) on the theme of waste, specially designed for teachers and students in Secondary I and II schools.
EDD-PER Guide Link	This guide (in french) aims to strengthen the links between disciplinary fields and Education for Sustainable Development (EDD). It is intended for teachers in primary and secondary education.