



Thematic Sheet 4/6

DIGITAL PRODUCTION

Sec. I and II

Eduki Competition 2025/2026

- Interconnected: human – digital – sustainab

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D) DIGITAL PRODUCTION

Extraction of rare materials, manufacturing conditions, environmental pollution, biodiversity

INTRODUCTION TO THE TOPIC

The production of digital devices relies on a global supply chain involving rare minerals, energy, and labor concentrated in specific regions. While it fosters innovation and access to technology, it raises social, environmental, and geopolitical issues, particularly concerning working conditions, ecological impact, and biodiversity.

The aim here is to explore **the true costs of digital device production and its impact on societies and the environment.**

TO START THE DEBATE

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

→ **Extraction of rare materials :**

- Where do strategic minerals such as cobalt, lithium, and rare earth elements come from?
- What are the social and environmental impacts of mining activities in producing countries?
- Are we too dependent on certain regions of the world to meet our supply demands?

→ **Manufacturing conditions:**

- Are the social and health conditions of workers in mines or assembly factories sufficient?

- Does the pressure for fast, low-cost production encourage human rights violations?
- Do consumers have a role to play through their choices and demands?

→ **Environmental pollution and biodiversity:**

- What is the impact of digital device production on air, water, and soil?
- Do manufacturing and disposal of electronic waste threaten certain species and ecosystems?
- Is it possible to develop a digital industry compatible with biodiversity protection?

SOME KEY STATISTICS

- The extraction of cobalt takes place in several countries around the world, such as Indonesia, Russia, Canada, and Australia. However, it occurs predominantly in the Democratic Republic of Congo (DRC), which accounts for about 73% of global production ([Canada's government's website, 2025](#)).
- Part of the cobalt mines in the DRC are artisanal, where human rights violations are regularly reported, including severe safety deficiencies, forced labor, and child labor([Council on Foreign Relations, 2020](#) ; [United States Department of Labor, 2023](#)).
- The growing development of cobalt mines in several regions of Africa increasingly threatens biodiversity, endangering nearly 180,000 great apes (gorillas, chimpanzees, and bonobos) whose forest habitats lie above the mining deposits ([The Guardian, 2024](#)).
- Cobalt mining causes severe pollution of water and soil, affecting agriculture and the health of local populations. The presence of heavy metals such as lead and uranium greatly exceeds the WHO's global guidelines. This significantly reduces agricultural production, kills aquatic wildlife, and causes malformations or rare diseases among residents ([PubMed Central, 2022](#) ; [earth.org, 2023](#)).

However, digital technology can also play a positive role in the production of digital devices:

- It helps raise awareness about the issues caused by digital device production, particularly regarding cobalt extraction.
- It allows optimizing digital device production by using fewer resources.

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

DID YOU KNOW ? (CASE STUDY)

Innovate to protect: create batteries without cobalt

→ An original example of environmental protection

Between 2020 and 2024, a project called COBRA was launched by the European Union to develop the first cobalt-free Li-ion battery for electric vehicles. The project led to the creation of a prototype battery that is not only functional but also 95% recyclable, all while avoiding the use of cobalt, one of the most commonly used minerals in battery production. The prototype is currently undergoing final tests and formalities, with the goal of deploying it in European electric vehicles by 2030.

SOME NON-EXHAUSTIVE PROJECT IDEAS

CATEGORY: ARTWORK

Project idea	Description
Mural– « <i>Biodiversity in danger</i> »	Students create a mural to raise awareness within the local community about the richness of biodiversity and the threats it faces.
Sculpture – « <i>Rethinking Telphones</i> »	Students collect old electronic components to create an artistic sculpture.

Painting – « Do Digital Devices Change Our Lives? »	Inspired by teachers' stories about their experiences before the digital era, students compare these memories with their current reality. This contrast inspires the creation of paintings illustrating their perception of the impact digital devices have on their daily lives.
Theater – « How Do Digital Devices Improve Our Lives? »	A reflection on the various ways digital devices enhance daily life. This reflection will lead to the creation and performance of a play.

CATEGORY: MEDIA CREATION

Project idea	Description
Short documentary film – « Recycle »	Visit to a recycling center and conducting interviews with the people who work there.
Street interviews – « Ecology ? And me ? »	Conducting street interviews where passersby are asked about their opinions and actions related to ecology.
Short film – «Where Would We Be Without Technology? »	Creating a film that invites reflection on what our lives would be like without technology, exploring its impacts on our daily lives and habits.

CATEGORY: CONCRETE ACTION

Project idea	Description
More Sustainable Cities in Switzerland and Worldwide	Students design sustainable and eco-friendly habitats by integrating solutions for energy, water, biodiversity, and climate change adaptation.
Awareness – «Ecological Footprint »	An analysis of what our digital footprint consists of and how to reduce it.

Workshop & Mural – «What Is My Smartphone Made Of? »	The goal is to raise awareness about the materials used (rare metals, rare earth elements, plastic, glass, etc.) through cards created by the students.
Mini-exhibition – «The Hidden Cost of a Smartphone»	Raising consumer awareness of the invisible yet very real impact of smartphone production, from raw material extraction to store shelves.
Conference – « Is a More Ethical Digital World Possible ? »	Organizing a conference with an expert on the topic of sustainable digital technology.

DRAW IDEAS FROM PREVIOUS WINNERS OR OTHER EXISTING PROJECTS

- Travelling pavilion – Campaign « Écrans, parlons-en ! »
- « Projektwoche » - Sarnen Primary School, OW

USEFUL RESOURCES

WEBSITES

Title	Description
Federal Office of Energy – Phones and Tablets <u>Link</u>	In Switzerland, smartphones and tablets must display an energy label indicating their efficiency, battery life, repairability, and durability. This measure helps consumers make more responsible and environmentally friendly choices.
WWF – Ecological Footprint Calculator	This calculator helps assess our ecological footprint to raise awareness

Link	and encourage the adoption of more sustainable habits.
Sustainability Week Link	The University of Geneva is offering two sessions of the Biodiversity Mural (in french).

PRESS ARTICLES

Title	Description
The Short Lifespan of Electronic Devices Harms the Environment Link	In Switzerland, nearly one in two people keep their old smartphones, tablets, or laptops at home, according to the Federal Statistical Office. In the digital sector, sustainability is therefore still in its early stages.
Digital Waste Has Increased by 30% in 12 Years, according to the UN Link	The UN is concerned about the “increasingly severe” environmental impact of digitalization. Digital waste rose by 30% between 2010 and 2022, according to estimates published Wednesday by UN Trade and Development (UNCTAD) in Geneva.
A Swiss Certification Aims to Make Data Centers Greener Link	Whether booking a hotel online, streaming a movie, or making a video call, data centers around the world consume large amounts of energy and water. A certification launched in Switzerland aims to reduce the environmental and climate impact of digital habits.

EDUCATIONAL RESOURCES

Title	Description
Consomm'action Link	This is a guide for responsible consumption (in french).
The real life of our waste: Changeons, agissons! Lien	Workshops for lower and upper secondary students: <i>La vraie vie de nos déchets: changeons, agissons!</i> 10 thematic choices (in french).
Soil and Subsoil... Questions to Dig Into Link	This educational resource covers various topics such as natural cycles, biodiversity, resources, and their exploitation (in french).