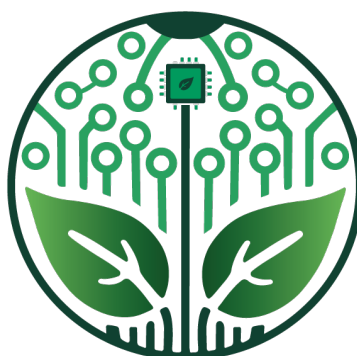




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LESSON PLAN

Circular Electronics: Repair, Reuse and Recycle

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Disclaimer



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1. TITLE

Circular Electronics: Repair, Reuse and Recycle

2. GRADE LEVEL

- ISCED Level 3 – Upper Secondary Education (ages 15–18)

3. SUBJECT AREA

- Sciences
- Environmental Studies
- Geography

4. TYPE

- Lesson Plan

5. DURATION

- 2 x 40-minute classes

6. LEARNING OBJECTIVES

- O1- Identify key materials in common electronic devices and their environmental impacts.
- O2- Explain the difference between reuse, repair, refurbishment and recycling in a circular economy.
- O3- Propose a school or community e-waste strategy supported by data or AI-based sorting.
- O4- Reflect on consumer choices and producer responsibility for electronics.



7. Key Competences Developed

- Literacy
- Mathematical competence and competence in STEM
- Digital competence
- Personal, social and learning to learn competence
- Citizenship competence

8. Prior Knowledge / Prerequisites

Basic knowledge of recycling concepts; no advanced technical knowledge required.

9. Lesson/Project Outline

Phase 1 – Introduction (Engage & Contextualize)

Teacher presents a few everyday electronics (old phone, charger, headphones) and asks: what happens when they break?

Activities:

Class brainstorm: Why do people replace devices? What parts could be reused or repaired?

Short video or photo set showing e-waste and informal recycling practices.

Mini-discussion:

Which device parts are valuable (metals) and which are harmful (batteries, plastics)?

Outputs: list of device components and first ideas for circular actions (repair, donate, recycle).

Resource (name)	Link (to the folder on Teams)
E-waste explained (video) https://www.youtube.com/watch?v=2y9R9XvX5nQ	

Phase 2 – Exploration (Investigate & Compare)

Students investigate the ‘life cycle’ of a device and where waste is created.

**Activities:**

In groups, students choose one device and map its life cycle: raw materials → production → use → end-of-life.

Students explore a teardown/repair guide (teacher provides links) and identify parts that can be replaced.

Optional data task: review simple class survey results about device replacement habits and identify patterns.

Discussion:

How could AI help? (sorting e-waste, identifying components, predicting failures, optimizing collection routes)

Outputs: life-cycle sketch and a list of AI-supported improvements.

Resource (name)	Link (to the folder on Teams)

Phase 3 – Application (Hands-On Practice)

Groups design a circular electronics initiative for the school/community.

Activities:

Choose one focus: repair day, donation/refurbishment, take-back collection, or better recycling.

Define what data you would collect (device type, condition, battery health, age) and how it helps decisions.

Propose where AI could be used (automatic sorting by camera, prioritizing repairable items, routing pickups).

Create a poster or short presentation with the plan and expected environmental benefits.

Outputs: circular electronics proposal, visual material, brief sustainability justification.

Resource (name)	Link (to the folder on Teams)

Phase 4 – Reflection & Consolidation (Present & Connect)

Groups present and reflect on responsibility across the value chain.

Reflection questions:

What is the biggest barrier to repair and reuse?

How can design choices make devices more recyclable?

Who should pay for e-waste management: consumers, companies, governments?

Outputs: presentations and individual ‘one change I can make’ commitments.



Resource (name)	Link (to the folder on Teams)

10. Assessment Criteria

Participation and quality of life-cycle mapping activity.
Feasibility and creativity of the circular electronics proposal.
Clear connection between data/AI and improved circular outcomes.
Reflection showing understanding of shared responsibility.

Resource (name)	Link (to the folder on Teams)

11. Teaching Materials

Name	Type (Developed/Existing)	Link	Role in the lesson
E-waste explained	Existing video	https://www.youtube.com/watch?v=2y9R9XvX5nQ	Phase 1

12. External Resources and References

Resource (name)	Link (external or to the folder on Teams)
The Global E-waste Monitor (overview)	https://ewastemonitor.info/
iFixit repair guides	https://www.ifixit.com/Guide