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GREEN LOOP

Lesson Plans

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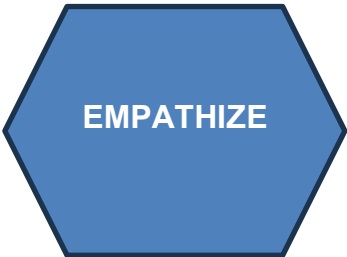
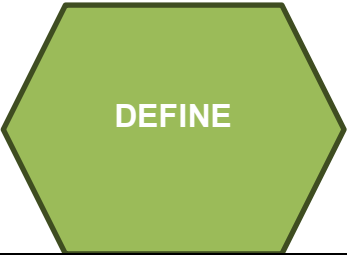
Mapping the product life cycle

GREEN LOOP LESSON PLAN

Lesson Title	Food Without Waste – Turning Surplus into Solutions
Curriculum Link / Subject	Home Economics / Biology / Mathematics / Entrepreneurship
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☐ Repair ☒ Recycle
Teacher	Helen Paju, Dairi Pärn
Grade Level	Lower Secondary (Grades 7-9)
Time/Duration	90 minutes
Objectives	Academic/subject /thinking skills objectives Identify where and why food is wasted in a school or household system. Interpret simple food-waste data and distinguish avoidable from unavoidable waste. Collaborate to design a practical food-waste prevention solution.
	Sustainability/Circular Objectives Apply the circular hierarchy: prevent first, redistribute second, compost last. Understand that food, water, energy and labour are embedded in every meal. Encourage responsible planning, storage and portion choices.
Systems Thinking Elements	• What affects what? Purchasing and portion choices → leftovers → disposal costs and emissions. • Where does waste or impact leak? Overbuying, unclear date labels, poor storage and oversized portions. • What small intervention could make a big difference? A share table, smarter portions or a “use-first” shelf.

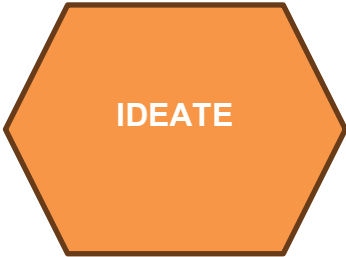
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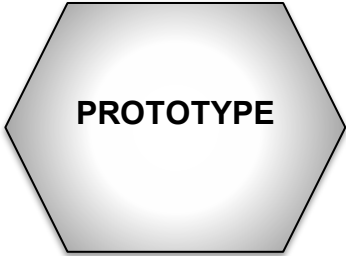
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 EMPATHIZE	Teacher-led (5 min) Show two contrasting lunch trays: one eaten, one with leftovers. Introduce the question: “When does food become waste?” Tools: photos or real trays, projector. Method: visual trigger. Individual (5 min) Students record one example of food they have recently seen thrown away and a possible reason. Tools: sticky notes / Mentimeter. Method: silent think time. Pair work (5 min) Pairs compare examples and sort causes into buying, cooking, serving, storage or eating habits. Tools: category cards. Method: Think-Pair-Sort. Whole-class discussion (5 min) Create a class “food-waste pathway” from purchase to bin and highlight recurring causes. Output: shared map of where food is lost. (teacher framing) → (individual) → (pair work) → (class discussion)
 DEFINE	Teacher-led framing (5 min) Explain the food-use hierarchy: prevent → share/redistribute → use as animal feed where appropriate → compost. Recycling nutrients is useful, but prevention keeps the most value. Tools: hierarchy diagram. Group analysis (3–4 students) (10 min)

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	Groups analyse a school-lunch scenario or one day of sample food-waste data. They answer: What food was wasted? How much? Why? Who can influence it? What resources were also wasted? Method: “Waste detective” worksheet. Tools: scales/data cards, calculator, worksheet. Whole-class sharing (5 min) Each group states one root cause, not only the visible symptom. Teacher clusters causes as information, infrastructure, habits or planning. Output: one clear “How might we...?” problem statement per group. (teacher framing) → (group analysis) → (sharing)
	Divergent brainstorming (5 min) Generate many prevention ideas: smaller first portions, share table, pre-ordering, clearer labels, leftover recipes, use-first fridge zone. One idea per note. Teacher prompt: “How could we stop the waste before it exists?” Sharing and clustering (5 min) Cluster ideas into prevention, redistribution and nutrient-return solutions. Tools: A3 sheet / Miro. Prioritising top idea (5 min) Use dot voting and an impact–effort check. Select one idea that is both useful and testable at school. Ask: “Who must change what for this to work?” Whole-class check-in (5 min) Give a 30-second pitch: problem, user, intervention and expected reduction.

	Expected output: one selected intervention per group. (brainstorm and cluster) → (prioritise) → (share)
 PROTOTYPE	Group prototyping (10 min) Create a prototype: share-table sign and rules, portion-choice menu, “use-first” label set, campaign poster, or simple tracking sheet/dashboard. Tools: paper, markers, recycled card / Canva, Google Sheets. Group refinement (5 min) Add user instructions, responsible person, materials needed and one measurable success indicator. Guiding: “How will you know less food was wasted?” Teacher walk-around & nudging (3 min) Ask: “Could your solution accidentally create another problem?” “Is food safety considered?” “Can all students use it?” Method: rapid coaching. Individual reflection note (2 min) Complete: “Our strongest prevention step is...” and “One risk we still need to solve is...” Expected output: labelled prototype and reflection. (prototype and refine) → (teacher nudging) → (reflection)

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	Peer feedback carousel (5 min) Groups present to a partner group. Feedback uses 2 strengths + 1 question, focusing on safety, fairness, ease of use and likely waste reduction. Tools: feedback slips / Google Form. Group refinement (5 min) Make at least one visible improvement and write: "The biggest improvement we made was..." Expected output: improved, school-ready mini-intervention. (peer feedback) → (group refinement)
Assessment & Reflection	Exit ticket: • "One thing I learned about the hidden resources in food is..." • "One action that prevents food waste before recycling is..."
Inclusion Strategies (UDL)	How will SEN/ELL learners be supported? • Clear instructions. Give directions orally and in writing, one step at a time. • Language scaffolds. Display key vocabulary, icons and sentence starters. • Flexible output. Students may draw, label, role-play or write short phrases. • Check-ins. Teacher visits groups intentionally and uses simplified guiding questions. What adaptations (visuals, scaffolds, group roles, language supports) will be offered? Visuals • Photos, real objects, process diagrams and colour-coded cards. Scaffolds • A structured analysis worksheet, example response and checklist. Group roles • Facilitator, recorder, materials manager, timekeeper and presenter.

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	Language supports • Sentence starters such as “The main problem is...” and “Our solution keeps value because...”. • Translation apps, bilingual dictionaries and peer support may be used.
Real-World Connection / Impact	Who will see or use this work (class, school, parents, community)? What real change could this activity create in school or daily life? The prototypes can be shared with the school canteen, student council and families. One selected idea can be piloted for a week, with students measuring leftovers before and after. The activity can lead to smaller first portions, clearer storage practices, a safe share table or regular food-waste audits. At home, students can use shopping lists, understand date labels, freeze food and plan meals around ingredients that need to be used first.

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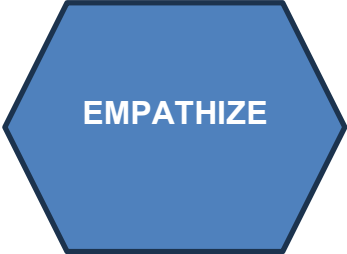
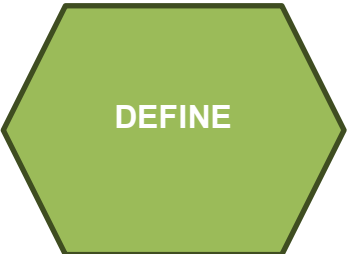
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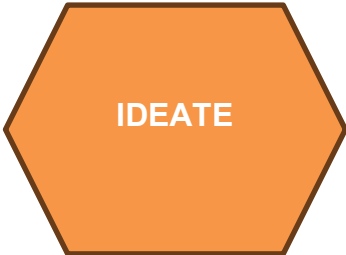
GREEN LOOP LESSON PLAN

Lesson Title	Wear It Longer – Repairing and Reimagining Clothes
Curriculum Link / Subject	Textiles / Art / Environmental Studies / Social Studies
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☒ Repair ☒ Recycle
Teacher	Helen Paju, Dairi Pärn
Grade Level	Lower Secondary (Grades 7-9)
Time/Duration	90 minutes
Objectives	Academic/subject /thinking skills objectives Explain key stages in the life cycle of a garment. Evaluate why clothing is discarded and identify repair or reuse options. Design and communicate a practical garment-life extension solution.
	Sustainability/Circular Objectives Understand why keeping clothes in use preserves materials, energy and labour. Practise repair, redesign and responsible consumption before textile recycling. Reflect on the social and environmental impacts of fast fashion.
Systems Thinking Elements	• What affects what? Trends and low prices → frequent buying → short use → textile waste. • Where does waste or impact leak? Poor quality, weak repair skills, impulse buying and limited collection systems. • What small intervention could make a big difference? A repair station, clothing swap or visible mending guide.

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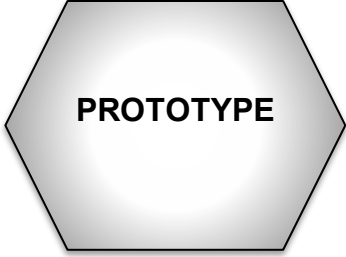
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	Teacher-led (5 min) Show a damaged but repairable garment and a fast-fashion advertisement. Ask: “Why do we stop wearing clothes?” Tools: garment, images, projector. Individual (5 min) Students choose one unworn item from memory and record why it is no longer used. Tools: sticky note / Padlet. Pair work (5 min) Pairs compare reasons and distinguish functional, emotional, social and size-related causes. Method: Think-Pair-Classify. Whole-class discussion (5 min) Build a class map of reasons for discarding clothes and identify which causes are preventable. Output: user needs for the DEFINE phase. (teacher framing) → (individual) → (pair work) → (class discussion)
	Teacher-led framing (5 min) Introduce the garment life cycle and the value-retention order: buy less, use longer, care, repair, share, redesign, then recycle. Tools: garment lifecycle diagram. Group analysis (3–4 students) (10 min) Each group performs a “Garment Autopsy”: material label, construction, damage, use history, repairability and possible next users. Prompts: What failed? Is repair possible? What skill or part is missing?

	Whole-class sharing (5 min) Groups share one repeated barrier. Teacher clusters barriers as skill, cost, access, design or attitude. Output: “How might we help students keep clothes in use longer?” (teacher framing) → (group analysis) → (sharing)
 IDEATE	Divergent brainstorming (5 min) Ideas may include visible mending kits, QR repair tutorials, swap events, redesign patches, uniform exchange or care-label guides. Rule: quantity before judgement. Sharing and clustering (5 min) Cluster ideas into care, repair, sharing and redesign. Tools: sticky notes / Miro. Prioritising top idea (5 min) Dot vote using impact, inclusiveness and feasibility. Ask: “Does this extend use or merely move waste elsewhere?” Whole-class check-in (5 min) 30-second pitch of the selected service, product or campaign. Expected output: one strong idea per group. (brainstorm and cluster) → (prioritise) → (share)

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 PROTOTYPE	Group prototyping (10 min) Create a repair instruction card, mending sample, clothing-swap system map, redesigned garment sketch or repair-station layout. Tools: fabric scraps, thread, needles, paper / Canva. Group refinement (5 min) Label materials, user steps, safety points and how the idea keeps garments in use. Keywords: durable, repairable, shareable, adaptable. Teacher walk-around & nudging (3 min) Ask: “Can a beginner use this?” “What if the garment changes owner?” “How will you avoid stigma around repaired clothing?” Method: coaching questions. Individual reflection note (2 min) Complete: “Repair adds value because...” and “One clothing habit I could change is...” Expected output: prototype plus reflection. (prototype and refine) → (teacher nudging) → (reflection)
 TEST & ITERATE	Peer feedback carousel (5 min) Peers assess clarity, attractiveness, practicality and real garment-life extension. Give 2 stars + 1 wish. Tools: feedback cards. Group refinement (5 min) Revise one instruction, feature or inclusion element. Expected output: improved prototype and one stated next step.

	(peer feedback) → (group refinement)
Assessment & Reflection	Exit ticket: “One thing I learned about the life cycle of clothing is...” “Before buying or discarding a garment, I will...”
Inclusion Strategies (UDL)	How will SEN/ELL learners be supported? - Clear instructions. Give directions orally and in writing, one step at a time. - Language scaffolds. Display key vocabulary, icons and sentence starters. - Flexible output. Students may draw, label, role-play or write short phrases. - Check-ins. Teacher visits groups intentionally and uses simplified guiding questions. What adaptations (visuals, scaffolds, group roles, language supports) will be offered? Visuals - Photos, real objects, process diagrams and colour-coded cards. Scaffolds - A structured analysis worksheet, example response and checklist. Group roles - Facilitator, recorder, materials manager, timekeeper and presenter. Language supports - Sentence starters such as “The main problem is...” and “Our solution keeps value because...”. - Translation apps, bilingual dictionaries and peer support may be used.
Real-World Connection / Impact	Who will see or use this work (class, school, parents, community)? What real change could this activity create in school or daily life? Students’ prototypes can become a school repair corner, a student-led clothes swap, a visible-mending exhibition or QR-linked repair library. Families and local craftspeople may contribute skills or materials. The activity can normalise repaired and second-hand clothing, reduce

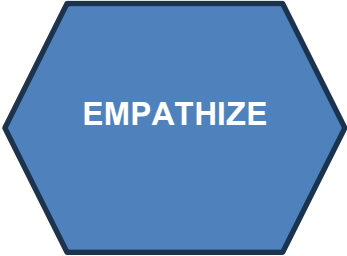
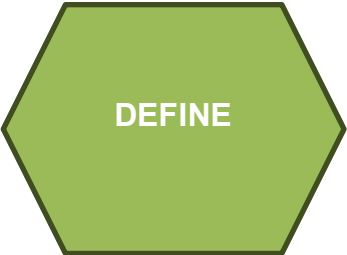
	unnecessary purchases and build practical confidence. A later class audit can compare how many garments were repaired, swapped or redesigned instead of discarded.
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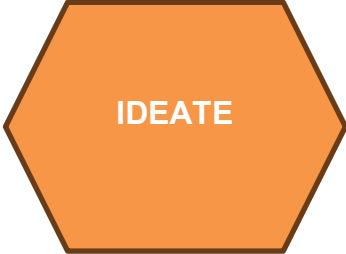
GREEN LOOP LESSON PLAN

Lesson Title	Fix Before You Bin – The Circular Life of Electronics
Curriculum Link / Subject	Technology / Physics / Environmental Studies / Digital Competence
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☒ Repair ☒ Recycle
Teacher	Helen Paju, Dairi Pärn
Grade Level	Lower Secondary (Grades 7-9)
Time/Duration	90 minutes
Objectives	Academic/subject /thinking skills objectives Identify materials and components in a common electronic device. Distinguish safe user maintenance from specialist repair. Design a system that extends device life and ensures responsible end-of-life handling.
	Sustainability/Circular Objectives Recognise the environmental and social value embedded in electronics. Prioritise maintenance, repair, reuse and refurbishment before recycling. Promote safe and responsible e-waste collection.
Systems Thinking Elements	• What affects what? Rapid upgrades and hard-to-repair design → shorter device life → more e-waste and material extraction. • Where does waste or impact leak? Glued parts, unavailable spares, weak maintenance and improper disposal. • What small intervention could make a big difference? A repairability guide, device-care clinic or school collection route.

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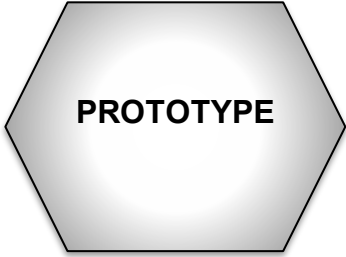
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	Teacher-led (5 min) Show an old phone, cable or mouse and ask: “Broken, outdated, or simply unwanted?” Emphasise that devices must not be dismantled unless declared safe. Tools: unplugged sample devices, images. Individual (5 min) Students list one unused electronic item at home and why it is unused. Tools: anonymous poll / sticky note. Pair work (5 min) Pairs compare reasons: battery, software, damage, fashion, missing charger or unknown disposal route. Method: Think-Pair-Sort. Whole-class discussion (5 min) Map the journey from raw materials to manufacture, use, repair, reuse and e-waste. Output: common points where value is lost. (teacher framing) → (individual) → (pair work) → (class discussion)
	Teacher-led framing (5 min) Explain maintenance, repair, refurbishment and recycling. Clarify safety: batteries, mains electricity and sealed devices require trained adults or specialists. Tools: circular electronics diagram, safety icons. Group analysis (3–4 students) (10 min) Groups analyse a device card: materials, likely failure, repair barriers, data/privacy needs and safest next pathway.

	Method: “Device diagnosis” worksheet; no live electrical work. Whole-class sharing (5 min) Share one design or system barrier and one stakeholder who can address it. Output: a focused challenge statement. (teacher framing) → (group analysis) → (sharing)
	Divergent brainstorming (5 min) Ideas: care checklist, charger library, repair booking flow, spare-parts map, refurbished-device exchange, secure data-wipe guide or e-waste collection campaign. Prompt: “How can we preserve the device’s highest value?” Sharing and clustering (5 min) Cluster into maintenance, repair, reuse and safe collection. Tools: notes / Miro.  (5 min) – Prioritising top idea (5 min)Vote using impact, safety, accessibility and feasibility. Ask: “Does the idea delay replacement?” Whole-class check-in (5 min) Give a one-sentence problem and one-sentence solution. Expected output: selected circular electronics intervention. (brainstorm and cluster) → (prioritise) → (share)

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 PROTOTYPE	Group prototyping (10 min) Create a device-care card, repairability label, school collection map, service storyboard or mock-up of a modular device. Tools: paper, recycled card / Canva, Figma, Tinkercad. Group refinement (5 min) Add safety warnings, user steps, responsible adult/partner and end-of-life route. Guiding: "What happens to personal data?" Teacher walk-around & nudging (3 min) Ask: "Can this be repaired without harming the user?" "Who supplies parts?" "Could the device be shared or refurbished?" Method: safety-focused coaching. Individual reflection note (2 min) Complete: "The most valuable part of a device is not only..." and "A safe next step for unused electronics is..." Expected output: labelled prototype and reflection. (prototype and refine) → (teacher nudging) → (reflection)
 TEST & ITERATE	Peer feedback carousel (5 min) Peer groups review usefulness, safety, data protection and potential to extend device life. Method: 2 strengths + 1 improvement. Group refinement (5 min) Add one visible improvement and state the safe implementation partner. Expected output: refined prototype ready for school discussion.

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	(peer feedback) → (group refinement)
Assessment & Reflection	Exit ticket: • “One thing I learned about e-waste and material value is...” • “One way I can extend the life of an electronic device is...”
Inclusion Strategies (UDL)	How will SEN/ELL learners be supported? • Clear instructions. Give directions orally and in writing, one step at a time. • Language scaffolds. Display key vocabulary, icons and sentence starters. • Flexible output. Students may draw, label, role-play or write short phrases. • Check-ins. Teacher visits groups intentionally and uses simplified guiding questions. What adaptations (visuals, scaffolds, group roles, language supports) will be offered? Visuals • Photos, real objects, process diagrams and colour-coded cards. Scaffolds • A structured analysis worksheet, example response and checklist. Group roles • Facilitator, recorder, materials manager, timekeeper and presenter. Language supports • Sentence starters such as “The main problem is...” and “Our solution keeps value because...”. • Translation apps, bilingual dictionaries and peer support may be used.
Real-World Connection / Impact	Who will see or use this work (class, school, parents, community)? What real change could this activity create in school or daily life? The work can be presented to the school’s ICT manager, families and a certified repair or e-waste partner. A practical result may be a charger-sharing box, device-care week, safe collection point or guide to repair and refurbishment services. Students learn that recycling is the final

	option after maintenance, repair and reuse, and that batteries, data and electrical safety require responsible handling.
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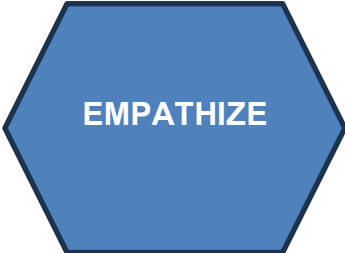
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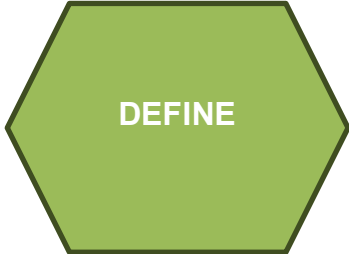
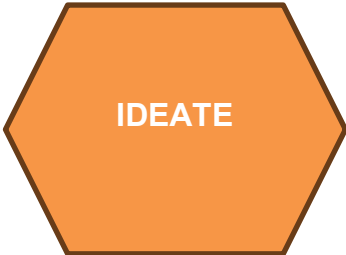
GREEN LOOP LESSON PLAN

Lesson Title	Share More, Own Less – Designing a School Library of Things
Curriculum Link / Subject	Social Studies / Mathematics / Entrepreneurship / Technology
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☒ Repair ☐ Recycle
Teacher	Helen Paju, Dairi Pärn
Grade Level	Lower Secondary (Grades 7-9)
Time/Duration	90 minutes
Objectives	Academic/subject /thinking skills objectives Analyse which rarely used products could be shared rather than individually owned. Use simple criteria and data to design a fair borrowing service. Collaborate to prototype a school “Library of Things”.
	Sustainability/Circular Objectives Understand access-based consumption and product-as-a-service models. Reduce duplicate purchases while increasing product utilisation. Plan for care, repair, responsibility and equitable access.
Systems Thinking Elements	• What affects what? Individual ownership → many underused items → high material demand and storage needs. • Where does waste or impact leak? Duplicate buying, idle products, unclear responsibility and poor maintenance.

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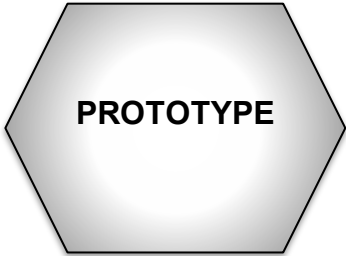
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	What small intervention could make a big difference? A trusted borrowing system with clear care and repair rules.
	Teacher-led (5 min) Display objects used only occasionally: tools, sports equipment, board games, chargers or craft kits. Ask: “Do we need to own everything we use?” Tools: objects or photos. Individual (5 min) Students list three items their household uses less than once a month. Tools: worksheet / digital poll. Pair work (5 min) Pairs identify which items could realistically be borrowed and what concerns users might have. Method: Think-Pair-Question. Whole-class discussion (5 min) Create two columns: benefits of sharing and barriers to sharing. Output: user needs such as trust, access, cleanliness and availability. (teacher framing) → (individual) → (pair work) → (class discussion)

	Teacher-led framing (5 min) Explain utilisation rate, sharing models and product-as-a-service. A circular service must also include maintenance, repair and return systems. Tools: simple ownership vs access diagram. Group analysis (3–4 students) (10 min) Groups select one category and analyse demand, likely users, borrowing frequency, risks, storage, cleaning and repair responsibilities. Tools: service-design worksheet, simple frequency data. Whole-class sharing (5 min) Share the greatest barrier and the stakeholder needed to solve it. Output: “How might we provide fair access to...?” (teacher framing) → (group analysis) → (sharing)
	Divergent brainstorming (5 min) Generate features: booking system, membership card, deposits, QR instructions, repair log, late-return reminders, accessibility rules and donation pathway. Rule: one feature per note. Sharing and clustering (5 min) Cluster into access, trust, maintenance and logistics. Tools: sticky notes / Miro. Prioritising top idea (5 min) Choose the most useful item category and minimum viable service features. Ask: “What is essential for a one-week pilot?”

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	Whole-class check-in (5 min) Pitch the user, item, borrowing process and circular benefit. Expected output: one service concept per group. (brainstorm and cluster) → (prioritise) → (share)
	Group prototyping (10 min) Create a service blueprint, borrowing card, app screen, shelf layout or role-play of the borrowing process. Tools: paper, labels, boxes / Canva, Google Forms. Group refinement (5 min) Add rules for care, damage, repair, inclusion, privacy and item return. Include one measure such as loans per month or avoided purchases. Guiding: “How will this remain fair?” Teacher walk-around & nudging (3 min) Ask: “Who is excluded?” “What happens when an item breaks?” “How do you keep the service simple?” Method: service-design coaching. Individual reflection note (2 min) Complete: “Sharing works when...” and “One item I would borrow rather than buy is...” Expected output: service prototype and reflection. (prototype and refine) → (teacher nudging) → (reflection)

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	Peer feedback carousel (5 min) Peers role-play borrower and manager, then give feedback on clarity, fairness and practicality. Tools: scenario cards. Group refinement (5 min) Fix one weak point in the user journey and add one repair/maintenance feature. Expected output: improved pilot-ready service. (peer feedback) → (group refinement)
Assessment & Reflection	Exit ticket: • “One thing I learned about access instead of ownership is...” • “One condition that makes sharing fair and reliable is...”
Inclusion Strategies (UDL)	How will SEN/ELL learners be supported? • Clear instructions. Give directions orally and in writing, one step at a time. • Language scaffolds. Display key vocabulary, icons and sentence starters. • Flexible output. Students may draw, label, role-play or write short phrases. • Check-ins. Teacher visits groups intentionally and uses simplified guiding questions. What adaptations (visuals, scaffolds, group roles, language supports) will be offered? Visuals • Photos, real objects, process diagrams and colour-coded cards. Scaffolds • A structured analysis worksheet, example response and checklist. Group roles • Facilitator, recorder, materials manager, timekeeper and presenter. Language supports • Sentence starters such as “The main problem is...” and “Our solution keeps value because...”.

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	• Translation apps, bilingual dictionaries and peer support may be used.
Real-World Connection / Impact	Who will see or use this work (class, school, parents, community)? What real change could this activity create in school or daily life? The class can present proposals to the student council, school leadership and parent community. A small pilot might begin with board games, sports equipment, event supplies, calculators or craft tools. Students can track loans, avoided purchases, repairs and user satisfaction. The service may strengthen community trust while reducing duplicate consumption and making useful items accessible to more people.

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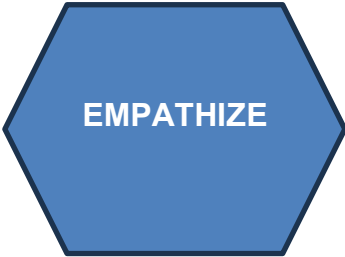
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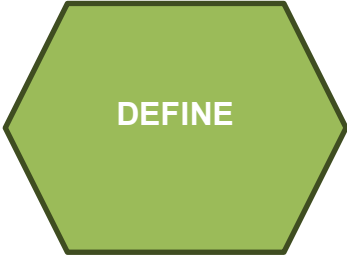
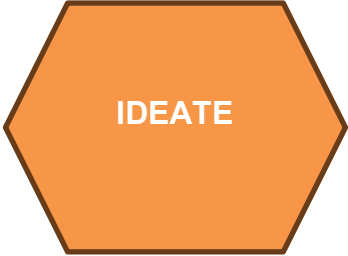
GREEN LOOP LESSON PLAN

Lesson Title	Packaging-Free Break – Redesigning the School Snack System
Curriculum Link / Subject	Health Education / Mathematics / Design & Technology / Entrepreneurship
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☐ Repair ☒ Recycle
Teacher	Helen Paju, Dairi Pärn
Grade Level	Lower Secondary (Grades 7-9)
Time/Duration	90 minutes
Objectives	Academic/subject /thinking skills objectives Audit common snack packaging and classify materials and functions. Compare single-use and reusable packaging systems using evidence. Design a realistic low-waste snack or canteen system.
	Sustainability/Circular Objectives Prioritise refusal and reuse over disposal and recycling. Understand that packaging choices are shaped by hygiene, convenience, price and infrastructure. Promote reusable, refillable and correctly sorted alternatives.
Systems Thinking Elements	- What affects what? Convenience and sales choices → single-use packaging → litter, collection and treatment. - Where does waste or impact leak? Mixed materials, contamination, missing refill options and unclear return systems.

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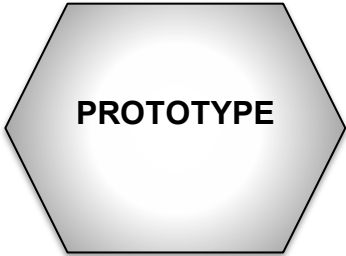
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	What small intervention could make a big difference? A deposit-return cup, unpackaged snack option or reusable container routine.
	Teacher-led (5 min) Show one day's clean snack packaging or a photo audit. Ask: "Which package was useful for minutes but remains waste for much longer?" Tools: clean samples, gloves, projector. Individual (5 min) Students record what packaging they used during the previous school day and why it was chosen. Tools: tally sheet / Mentimeter. Pair work (5 min) Pairs compare packaging functions: protection, hygiene, transport, information and marketing. Method: Think-Pair-Match. Whole-class discussion (5 min) Cluster packaging by material and function; distinguish necessary function from avoidable excess. Output: packaging problem map. (teacher framing) → (individual) → (pair work) → (class discussion)

	Teacher-led framing (5 min) Explain the hierarchy: refuse unnecessary packaging, reduce material, reuse containers, then recycle correctly. Reuse needs washing, return and user participation. Tools: packaging hierarchy diagram. Group analysis (3–4 students) (10 min) Groups analyse one snack product or canteen item: material layers, use time, sorting route, contamination, user needs and alternative delivery systems. Method: “Packaging autopsy” worksheet. Whole-class sharing (5 min) Share one avoidable feature and one legitimate requirement such as food safety. Output: a balanced “How might we reduce packaging while still...?” statement. (teacher framing) → (group analysis) → (sharing)
	Divergent brainstorming (5 min) Ideas: deposit cups, refill dispensers, reusable lunchbox campaign, bulk snack station, return crate, packaging-free day or clearer sorting signs. Prompt: “Can the service change, not only the material?” Sharing and clustering (5 min) Cluster into refusal, reduction, reuse and sorting support. Tools: sticky notes / Miro. Prioritising top idea (5 min) Dot vote using waste prevention, hygiene, cost and ease of adoption. Ask: “What behaviour and infrastructure are both required?”

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	Whole-class check-in (5 min) Give a 30-second system pitch: user, container/package, return or refill step, and benefit. Expected output: one chosen system idea. (brainstorm and cluster) → (prioritise) → (share)
	Group prototyping (10 min) Build a reusable-packaging journey map, deposit token, refill-station mock-up, instruction sign or improved package model. Tools: cleaned packaging, cardboard, markers / Canva. Group refinement (5 min) Add hygiene steps, responsible roles, return points, accessibility and one measurement such as items avoided per week. Guiding: “Where could the reusable item be lost?” Teacher walk-around & nudging (3 min) Ask: “Is the alternative truly reusable?” “Who washes it?” “Will it work at busy break time?” Method: systems coaching. Individual reflection note (2 min) Complete: “The most unnecessary packaging I noticed was...” and “A reuse system succeeds when...” Expected output: labelled prototype and reflection. (prototype and refine) → (teacher nudging) → (reflection)

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	Peer feedback carousel (5 min) Peers test the user journey and assess hygiene, convenience, clarity and likely waste prevention. Method: 2 strengths + 1 improvement. Group refinement (2 min) Revise one system step and add a clear call to action. Expected output: improved low-waste snack-system proposal. (peer feedback) → (group refinement)
Assessment & Reflection	Exit ticket: • “One thing I learned about packaging systems is...” • “One single-use item I could refuse or replace is...”
Inclusion Strategies (UDL)	How will SEN/ELL learners be supported? • Clear instructions. Give directions orally and in writing, one step at a time. • Language scaffolds. Display key vocabulary, icons and sentence starters. • Flexible output. Students may draw, label, role-play or write short phrases. • Check-ins. Teacher visits groups intentionally and uses simplified guiding questions. What adaptations (visuals, scaffolds, group roles, language supports) will be offered? Visuals • Photos, real objects, process diagrams and colour-coded cards. Scaffolds • A structured analysis worksheet, example response and checklist. Group roles • Facilitator, recorder, materials manager, timekeeper and presenter. Language supports • Sentence starters such as “The main problem is...” and “Our solution keeps value because...”.

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	• Translation apps, bilingual dictionaries and peer support may be used.
Real-World Connection / Impact	Who will see or use this work (class, school, parents, community)? What real change could this activity create in school or daily life? Proposals can be shared with the canteen provider, school leadership, student council and families. A class may pilot a packaging-free snack day, reusable cup deposit system or lunchbox challenge and count avoided items. The work can influence purchasing decisions, sorting signage and school-event planning. Students also gain a practical lens for judging packaging by necessity, reusability and the full system around it.

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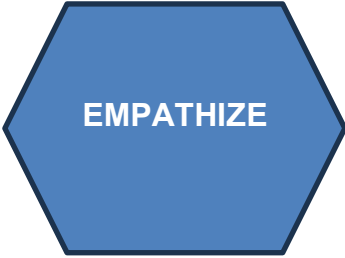
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GREEN LOOP LESSON PLAN

Lesson Title	Furniture with a Future – Repairing and Reusing School Furniture
Curriculum Link / Subject	Design & Technology / Mathematics / Art / Entrepreneurship
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☒ Repair ☒ Recycle
Teacher	Helen Paju, Dairi Pärn
Grade Level	Lower Secondary (Grades 7-9)
Time/Duration	90 minutes
Objectives	Academic/subject /thinking skills objectives Analyse the construction, materials, function, and condition of school furniture. Measure furniture accurately and apply scale, proportion, and basic technical drawing. Develop and communicate a realistic repair or reuse solution collaboratively.
	Sustainability/Circular Objectives Understand why maintenance, repair, refurbishment, and reuse keep products and materials in circulation. Compare repair and replacement using environmental, practical, and financial criteria. Recognise furniture as a system of replaceable parts rather than a disposable object.
Systems Thinking Elements	• What affects what? Purchasing choices → furniture durability → maintenance needs → waste and school costs.

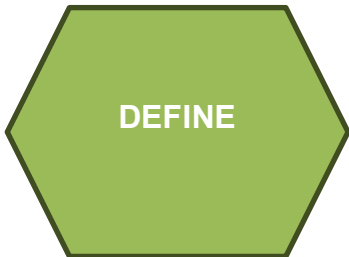
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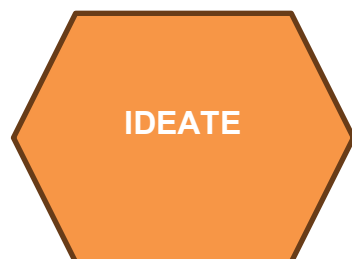
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	• Where does waste or impact leak? Loose joints are ignored, surfaces are damaged, spare parts are unavailable, and usable furniture is replaced for aesthetic reasons. • What small intervention could make a big difference? A routine condition check, replaceable components, and a school repair-and-reuse protocol.
	Teacher-led (5 min) Show photographs of a new chair, a scratched but usable chair, a loose chair, and a broken chair. Ask: “At what point do we decide that furniture has become waste?” • Tools: Projector, photographs, one real chair or desk if available. • Method: Visual trigger + teacher framing. Individual observation (5 min) Students silently inspect one item of classroom furniture and record evidence under four headings: works well, worn, unsafe, could be improved. • Tools: Observation card, pencil, ruler. • Method: Notice before judging. Pair work (5 min) Pairs compare observations and distinguish cosmetic damage from functional or safety problems. Prompts: “Does this affect appearance, comfort, function, or safety?” “Could one small part solve the problem?” • Method: Think–Pair–Share. Whole-class discussion (5 min) Create a class condition map: maintain / repair / refurbish / repurpose / recycle. • Tools: Board, sticky notes or Padlet. • Output: Shared understanding that different conditions require different circular actions.

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	Teacher-led → Individual observation → Pair work → Whole-class discussion
	Teacher-led framing (5 min) Introduce the furniture life cycle: raw materials → manufacturing → transport → school use → maintenance → repair/refurbishment → reuse → material recovery. Explain that extending useful life usually preserves more value than immediately recycling materials. • Tools: Linear and circular furniture-life diagrams. Group “Furniture Health Check” (3–4 students) (10 min) Each group studies one chair, desk, shelf, or storage unit. Student prompts: 1. What materials and separate components can you identify? 2. Which parts carry the greatest load or wear fastest? 3. What is damaged, loose, uncomfortable, or difficult to clean? 4. Can the item be disassembled without destroying it? 5. Which part could be maintained, repaired, replaced, or redesigned? 6. What would happen if the school simply bought a new one? • Tools: Ruler/tape measure, checklist, removable labels, camera. • Method: Product autopsy without destructive disassembly. Whole-class sharing (5 min) Groups name one recurring weakness. The teacher clusters findings: joints, surfaces, ergonomics, missing parts, poor repairability. • Output: One precise design challenge per group, written as: “How might we extend the useful life of this item by...?” Teacher-led framing → Group “Furniture Health Check” → Whole-class sharing



Divergent brainstorming (5 min)

Groups generate as many solutions as possible. Ideas may involve maintenance, repair, interchangeable parts, surface renewal, new use, or a school service system.

Teacher prompts:

- “How could the damaged part be replaced rather than the whole item?”
- “Could this item serve another function?”
- “How would we make the next repair easier?”
- “Could reclaimed materials be used safely?”
- Tools: Sticky notes, A3 sheet, Miro.

Sharing and clustering (5 min)

Sort ideas into: maintain, repair, refurbish, repurpose, system change.

Guiding questions: “Which ideas preserve the most existing value?” “Which prevent the same problem returning?”

Decision matrix (5 min)

Score two or three ideas from 1–3 for safety, waste prevented, cost, feasibility, and durability. Select one concept.

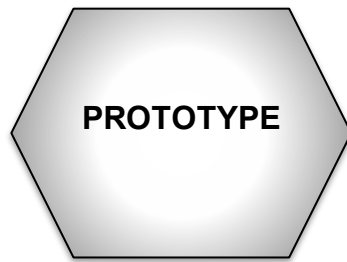
- Tools: Printed matrix or shared spreadsheet.

Whole-class check-in (5 min)

Each group gives a 30-second pitch: item + diagnosed problem + selected circular intervention.

Expected Output: One justified solution ready to prototype.

Divergent brainstorming → Sharing and clustering → Decision matrix → Whole-class check-in



Group prototyping (10 min)

Create one of the following:

- an annotated technical sketch showing repair or replacement parts;
- a scale paper/cardboard model of a new component;
- a before-and-after refurbishment board;
- a service prototype for reporting, storing, and repairing furniture.

The prototype must label materials, dimensions, joining method, and the circular strategy used.

- Tools: A3 paper, rulers, cardboard, reclaimed materials, fasteners, Canva or Tinkercad.
- Safety: Students do not carry out structural repairs or use hazardous tools during this lesson.

Group refinement (5 min)

Add a “next life” statement:

- How long could the intervention extend useful life?
- What can be replaced again later?
- What happens to removed materials?
- Who is responsible for maintenance?

Teacher walk-around and nudging (3 min)

Prompts: “Would this remain safe under repeated use?” “What evidence supports your chosen dimensions?” “Have you designed access for the next repair?”

Individual reflection note (2 min)

“My contribution to the prototype was...”

“Our solution keeps value in circulation because...”

Expected Output: Labelled prototype and individual reflection.

Group prototyping → Group refinement → Teacher walk-around and nudging → Individual reflection note

	Peer feedback carousel (5 min) Groups present their solution. Partners use three checks: 1. Is it safe and functional? 2. Does it extend life or avoid replacement? 3. Is the next repair or reuse step clear? Feedback format: 2 strengths + 1 practical improvement. • Tools: Feedback slips or Google Form. Group refinement (5 min) Groups add at least one visible improvement and complete the statement: “Compared with replacement, our solution preserves...” Teacher guiding: “Which feedback changes function rather than appearance only?” “What would a caretaker, technician, or user need to know?” Expected Output: Improved prototype and a short circular justification. Peer feedback carousel → Group refinement
Assessment & Reflection	Exit ticket: • “One sign that furniture should be repaired rather than replaced is...” • “One school routine that could extend furniture life is...” • Self-assessment: I used evidence / measurements / circular principles (choose two and explain briefly). •
Inclusion Strategies (UDL)	How will SEN/ELL learners be supported? • Clear instructions. Present each phase orally, visually, and in writing. • Concrete objects. Use real furniture and picture cards to make vocabulary visible. • Language scaffolds. Sentence starters: “The problem is located at...”, “This part could be...”, “Our solution extends life by...”

	• Flexible output. Students may demonstrate through a labelled drawing, model, photographs, or short oral explanation. • Check-ins. Teacher confirms that each group distinguishes appearance, function, and safety. What adaptations will be offered? Visuals • Component diagram with words such as leg, joint, fastener, surface, frame, hinge. • Examples of maintain / repair / refurbish / repurpose. Scaffolds • Furniture Health Check with icons and yes/no prompts. • Partly completed decision matrix. Group roles • Inspector, measurer, recorder, designer, presenter. Language supports • Bilingual word bank and translation tools. • Option to rehearse the pitch with a partner before presenting.
Real-World Connection / Impact	Who will see or use this work (class, school, parents, community)? What real change could this activity create in school or daily life? The prototypes can be presented to the school caretaker, management team, student council, or local craft and repair professionals. Selected proposals may become part of a “Furniture with a Future” exhibition that displays the item’s current condition, proposed intervention, expected life extension, and materials saved. The activity can lead to a practical school furniture register with categories such as monitor, maintain, repair, refurbish, and reuse. Students may develop a simple reporting label or digital form for loose parts and damage, helping the school intervene before small defects become

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	expensive failures. Reusable components and sound furniture could also be stored for future repairs rather than discarded. In daily life, students learn to inspect objects, diagnose problems, and seek repair or second-hand options before purchasing replacements. The central impact is a shift from seeing worn objects as rubbish to seeing them as collections of materials, labour, functions, and future possibilities.
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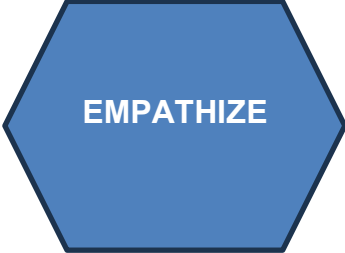
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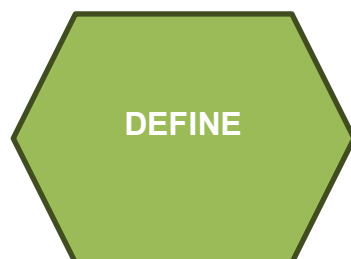
GREEN LOOP LESSON PLAN

Lesson Title	Celebrate in a Circle – Designing a Zero-Waste School Event
Curriculum Link / Subject	Civics / Mathematics / Home Economics / Entrepreneurship / Arts
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☒ Repair ☒ Recycle
Teacher	Helen Paju, Dairi Pärn
Grade Level	Lower Secondary (Grades 7-9)
Time/Duration	90 minutes
Objectives	Academic/subject /thinking skills objectives Analyse the material and resource flows of a school celebration or community event. Use estimation, comparison, and prioritisation to create a feasible event plan. Collaborate to communicate roles, rules, and solutions to different stakeholders.
	Sustainability/Circular Objectives Apply the waste hierarchy to catering, decorations, communication, and equipment. Design systems that prevent waste through refusal, reduction, reuse, sharing, and correct material recovery. Understand that a circular event depends on coordinated choices before, during, and after the event.
Systems Thinking Elements	What affects what? Guest numbers and organiser choices → purchasing and service systems → leftover materials and waste quality.

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	• Where does waste or impact leak? Over-ordering, single-use serviceware, one-time decorations, unclear sorting, and items with no owner after the event. • What small intervention could make a big difference? Accurate registration, reusable systems, clear responsibilities, and a plan for every material after use.
	Teacher-led (5 min) Display a “celebration table after the guests leave”: disposable cups, balloons, food leftovers, printed programmes, and decorations. Ask: “Which of these became waste because of decisions made before the event?” • Tools: Photo or staged table, projector. • Method: Visual trigger + backward thinking. Individual memory map (5 min) Students recall a school event, birthday, festival, or sports day and list what was bought, used, left over, and thrown away. • Tools: Four-box worksheet or Padlet. Pair comparison (5 min) Pairs identify one avoidable item and one useful practice they observed. Prompts: “What could have been refused?” “What could have been borrowed or reused?” Whole-class material-flow map (5 min) Cluster responses under food, serving items, decorations, communication, equipment, and transport. • Output: Shared map of where waste is created across an event system. Teacher-led → Individual memory map → Pair comparison → Whole-class material-flow map



Teacher-led framing (5 min)

Explain that a zero-waste event is not an event with many recycling bins; it is an event designed so that unnecessary materials do not enter the system and useful items remain in circulation. Introduce the planning sequence: refuse → reduce → borrow/share → reuse → repair → recycle/compost.

- Tools: Event waste hierarchy infographic.

Group event audit (3–4 students) (10 min)

Groups receive a scenario: school anniversary, winter fair, sports day, graduation reception, or international project day.

Student prompts:

1. Who attends and how many people should be planned for?
2. Which needs are essential and which are optional?
3. What materials enter the event?
4. Who owns each item before and after the event?
5. Where might leftovers, contamination, or forgotten items occur?
6. Which decision has the greatest waste impact?

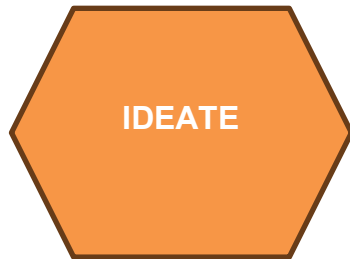
- Tools: Scenario card, flow-map worksheet, calculators.
- Method: Stakeholder and material-flow analysis.

Whole-class sharing (5 min)

Groups share one “leak” in their event system. Teacher clusters leaks as quantity, ownership, single-use design, communication, or end-of-event management.

- Output: A challenge statement: “How might we organise ___ for ___ people while preventing ___?”

Teacher-led framing → Group event audit → Whole-class sharing



Divergent brainstorming (5 min)

Groups generate prevention ideas across five stations: food, tableware, decoration, information, and equipment.

Teacher prompts:

- “Can we remove the need for this item?”
- “Can guests bring, borrow, refill, or return it?”
- “Can one object serve several events?”
- “How will people know what to do?”
- Tools: Station sheets, sticky notes or Miro.

Build a circular bundle (5 min)

Cluster ideas into a coordinated package rather than isolated actions. Example: registration + portion estimate + reusable dishes + return station + leftover redistribution.

Impact/effort prioritisation (5 min)

Place ideas on an impact–effort matrix. Choose at least one prevention action, one reuse/share action, and one end-of-event action.

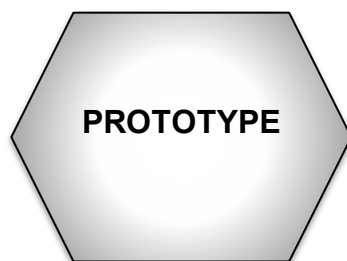
- Tools: A3 matrix, dots or digital board.

Whole-class check-in (5 min)

30-second event pitch: “Our event is circular because before, during, and after the event we will...”

Expected Output: A coherent three-stage event concept.

Divergent brainstorming → Build a circular bundle → Impact/effort prioritisation → Whole-class check-in



Group prototyping (10 min)

Create a one-page “Circular Event Operating Plan” containing:

- estimated guest number and one key quantity calculation;
- material-flow diagram: enters → used → collected → next use;
- reusable/borrowed equipment list;
- signs or instructions for guests;
- named responsibilities before, during, and after the event.

Groups may also prototype a return-station sign, reusable decoration module, digital invitation, or deposit-token system.

- Tools: A3 paper, markers, sample containers, Canva, spreadsheet.

Stress test (5 min)

Apply one surprise card: 20 extra guests, rain, missing dishwasher, dietary change, or a supplier delivering single-use items. Adapt the plan without abandoning its circular goals.

Teacher walk-around and nudging (3 min)

Prompts: “Who is responsible when the event ends?” “What happens if guests ignore the system?” “Does your calculation include a reasonable buffer without encouraging over-ordering?”

Individual reflection note (2 min)

“The event decision with the greatest preventive effect is...”

“One role I could personally take is...”

Expected Output: Tested operating plan and individual reflection.

Group prototyping → Stress test → Teacher walk-around and nudging → Individual reflection note

	Stakeholder feedback carousel (5 min) Groups exchange plans and adopt roles: guest, organiser, cleaner/caretaker, caterer, or finance manager. Each reviewer identifies: • one part that is clear and easy to follow; • one possible failure point; • one improvement for inclusion or feasibility. • Tools: Role cards and feedback sheet / Google Form. Group refinement (5 min) Groups revise one calculation, instruction, responsibility, or material loop. They add a visible “Plan B” and complete: “No item becomes anonymous after the event because...” Expected Output: Improved circular event plan with clear ownership and contingency. Stakeholder feedback carousel → Group refinement
Assessment & Reflection	Exit ticket: • “A zero-waste event begins before the event because...” • “One single-use item I would refuse or replace is...” • “The most important role after the event is... because...”
Inclusion Strategies (UDL)	How will SEN/ELL learners be supported? • Clear sequence. Use icons for before / during / after. • Language scaffolds. Sentence starters: “Guests will...”, “The organiser must...”, “After use, this item goes to...” • Flexible output. Students may use symbols, a flow diagram, short labels, or recorded speech. • Reduced cognitive load. Provide one scenario and a limited set of materials to groups needing additional structure. • Check-ins. Teacher verifies quantities, responsibilities, and the next destination of materials.

	What adaptations will be offered? Visuals • Picture cards for food, dishes, decorations, signs, bins, transport, and storage. • Colour-coded material-flow arrows. Scaffolds • Partly completed operating-plan template and worked quantity example. • Priority cards: essential / useful / unnecessary. Group roles • Event coordinator, resource calculator, systems mapper, communication designer, presenter. Language supports • Bilingual vocabulary list and translation applications. • Option to present jointly or use prepared cue cards.
Real-World Connection / Impact	Who will see or use this work (class, school, parents, community)? What real change could this activity create in school or daily life? The plans can be presented to the student council, teachers organising school traditions, catering staff, the school management team, parent representatives, or community event organisers. A selected plan could be tested at an actual class evening, project day, fair, sports event, or reception. The activity can produce reusable school resources: an event-equipment inventory, a lending list, standard digital invitations, quantity calculators, reusable signs, a return-station kit, and a short checklist assigning responsibility for leftovers and materials. Measuring the number of disposable items avoided or the quantity of leftovers can make the impact visible.

	Students also transfer the approach to birthdays and family gatherings. Instead of treating waste sorting as the main solution, they learn to plan demand, refuse unnecessary items, share equipment, design for repeated use, and ensure that every material has a clear next destination.
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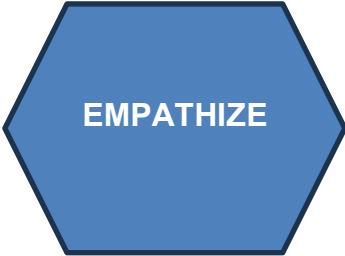
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GREEN LOOP LESSON PLAN

Lesson Title	Every Drop Counts – Designing a Circular School Water System
Curriculum Link / Subject	Science / Geography / Mathematics / Design & Technology
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☒ Repair ☒ Recycle
Teacher	Helen Paju, Dairi Pärn
Grade Level	Lower Secondary (Grades 7-9)
Time/Duration	90 minutes
Objectives	Academic/subject /thinking skills objectives Analyse where water enters, is used, and leaves a school system. Collect and interpret simple water-use data and identify patterns. Develop and communicate a feasible intervention that reduces water loss.
	Sustainability/Circular Objectives Understand water as a finite resource that can be conserved, reused, and returned safely to natural cycles. Distinguish between necessary water use, avoidable waste, and suitable reuse. Recognise how small changes in behaviour, equipment, and monitoring affect the whole system.
Systems Thinking Elements	What affects what? User behaviour → water demand → energy use for heating and pumping → wastewater → environmental impact.

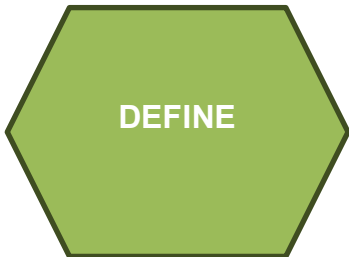
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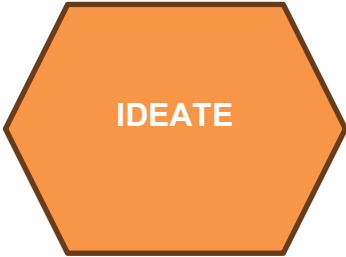
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	• Where does waste or impact leak? Dripping taps, unnecessary flushing, running water, poor monitoring, and clean water used where lower-quality water would be sufficient. • What small intervention could make a big difference? Detecting leaks early, installing clear prompts, and matching water quality to its purpose.
	Teacher-led (5 min) Show two contrasting images: a dripping tap and a closed-loop water system. Ask: “Where does our school’s water come from, and where does it go after we use it?” • Tools: Projector, photographs, short animation or diagram. • Method: Visual trigger + teacher framing. Individual observation (5 min) Students list every way they have used water since arriving at school and mark each use as essential, reducible, or uncertain. • Tools: Observation card or digital form. • Method: Personal water-use snapshot. Pair work (5 min) Pairs compare lists and identify one hidden water use, such as cleaning, heating, food preparation, or toilet flushing. Prompts: “Which use surprised you?” “Where might clean water be used only once?” • Method: Think–Pair–Share. Whole-class discussion (5 min) Build a class water map: source → use → drain → treatment → environment. • Tools: Board, sticky notes or Padlet. • Output: Shared picture of the school as part of a larger water cycle.

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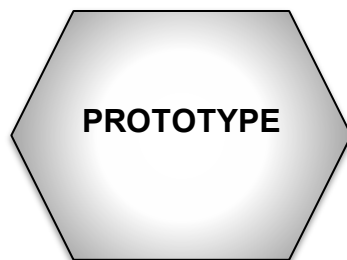
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	Teacher-led → Individual observation → Pair work → Whole-class discussion
	Teacher-led framing (5 min) Explain the difference between the natural water cycle and the human-managed water system. Introduce the hierarchy: avoid unnecessary use → improve efficiency → collect and reuse safely → return water responsibly. • Tools: Water-cycle and school-system diagrams. Group “Water Walk” analysis (3–4 students) (10 min) Groups examine one school water-use point from photographs, a map, or a supervised location: sink, toilet, kitchen, sports area, or garden. Student prompts: 1. What is the water used for? 2. How often and for how long is it used? 3. Where could water be lost or overused? 4. Is drinking-quality water necessary for this purpose? 5. What behaviour, equipment, or information affects use? 6. How could success be measured? • Tools: Checklist, stopwatch, measuring container or estimated flow-rate card, school plan. • Method: System observation without disrupting school activities. Whole-class sharing (5 min) Groups name one repeated problem. The teacher clusters findings: leaks, habits, equipment, information, reuse opportunities. • Output: One challenge statement per group: “How might we reduce water use at... without reducing hygiene or comfort?”

	Teacher-led framing → Group “Water Walk” analysis → Whole-class sharing
 IDEATE	Divergent brainstorming (5 min) Groups generate solutions involving behaviour, equipment, measurement, rainwater, or safe greywater use. Teacher prompts: • “How could users see the amount of water they use?” • “What could stop a small leak becoming a large loss?” • “Where could rainwater replace drinking water?” • “How could the solution work for younger pupils?” • Tools: Sticky notes, A3 sheet, Miro. Sharing and clustering (5 min) Sort ideas into: avoid, reduce, monitor, collect, reuse. Guiding questions: “Which idea prevents waste at the source?” “Which requires safety rules or adult approval?” Decision matrix (5 min) Score ideas from 1–3 for water saved, hygiene and safety, cost, feasibility, and ease of measurement. Select one concept. • Tools: Printed matrix or spreadsheet. Whole-class check-in (5 min) Each group gives a 30-second pitch: location + problem + intervention + indicator of success. Expected Output: One justified water-saving concept ready to prototype. Divergent brainstorming → Sharing and clustering → Decision matrix → Whole-class check-in

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Group prototyping (10 min)

Create one of the following:

- an annotated redesign of a water-use point;
- a model of a rainwater collection or reuse system;
- a user prompt, flow indicator, or leak-reporting tool;
- a monitoring dashboard showing baseline and target use.

The prototype must show water entering, being used, and leaving or returning to the loop.

- **Tools:** A3 paper, cardboard, reusable materials, markers, Canva or Tinkercad.
- **Safety:** No changes are made to plumbing; any reuse proposal must clearly identify hygiene limits.

Group refinement (5 min)

Add a measurement plan:

- What will be measured?
- When and by whom?
- What result would show improvement?
- What unintended effect must be avoided?

Teacher walk-around and nudging (3 min)

Prompts: “Does the proposal maintain hygiene?” “Where could the system leak?” “Is the saved amount measurable?”

Individual reflection note (2 min)

“One water-use habit I noticed was...”

“Our solution changes the system by...”

Expected Output: Labelled prototype and individual reflection.

	Group prototyping → Group refinement → Teacher walk-around and nudging → Individual reflection note
	Peer feedback carousel (5 min) Groups present their system. Partners use three checks: 1. Is it safe and hygienic? 2. Does it reduce demand or keep water in useful circulation? 3. Can the impact be measured? Feedback format: 2 strengths + 1 practical improvement. • Tools: Feedback slips or Google Form. Group refinement (5 min) Groups add at least one visible improvement and complete: “Our intervention saves water because...” Teacher guiding: “Which feedback improves the whole system?” “Could the solution accidentally shift the problem elsewhere?” Expected Output: Improved prototype and measurable success criterion. Peer feedback carousel → Group refinement
Assessment & Reflection	Exit ticket: • “One place where water is lost or overused at school is...” • “One circular water principle I can apply at home is...” • Self-assessment: I used observation / data / systems thinking (choose two and explain briefly).
Inclusion Strategies (UDL)	How will SEN/ELL learners be supported? • Clear instructions. Present the task orally, visually, and in writing.

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	• Concrete examples. Use photographs and familiar school locations. • Language scaffolds. Sentence starters: “Water enters from...”, “Water is wasted when...”, “Our intervention will...” • Flexible output. Students may draw a flow diagram, build a model, record audio, or write short phrases. • Check-ins. Teacher verifies understanding of safe versus unsafe water reuse. What adaptations will be offered? Visuals • Picture cards for tap, drain, rainwater, wastewater, treatment, reuse. • Colour-coded arrows for water entering, circulating, and leaving. Scaffolds • Partly completed school water map and decision matrix. • Simple flow-rate reference card. Group roles • Observer, mapper, data recorder, designer, presenter. Language supports • Bilingual word bank and translation tools. • Opportunity to rehearse the pitch with a partner.
Real-World Connection / Impact	Who will see or use this work (class, school, parents, community)? What real change could this activity create in school or daily life? The proposals can be shared with the school management team, caretaker, student council, or local water utility. A selection may form a “Every Drop Counts” display combining system maps, prototypes, and estimated savings.

	The activity can lead to a real water audit, a leak-reporting routine, clearer signage, or a pilot rainwater solution for garden use where regulations and safety allow. Students can compare baseline and follow-up measurements, making the impact visible rather than relying only on good intentions. In daily life, students learn to see water use as part of an interconnected system involving energy, infrastructure, ecosystems, and shared responsibility. The central change is moving from “use and drain” to “value, measure, reduce, and safely reuse.”
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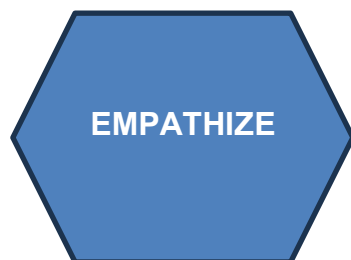
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GREEN LOOP LESSON PLAN

Lesson Title	Paper Has More Than One Story – Closing the School Paper Loop
Curriculum Link / Subject	Language Arts / Art / Mathematics / Environmental Studies
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☒ Repair ☒ Recycle
Teacher	Helen Paju, Dairi Pärn
Grade Level	Lower Secondary (Grades 7-9)
Time/Duration	90 minutes
Objectives	Academic/subject /thinking skills objectives Investigate how paper is produced, used, collected, and recovered. Use simple data to compare paper-use patterns and identify avoidable consumption. Create a communication or service solution that improves the school paper loop.
	Sustainability/Circular Objectives Understand that recycling is only one step after refusing, reducing, and reusing. Recognise the value of fibres and the limits of repeated paper recycling. Promote responsible printing, reuse, sorting, and purchasing choices.
Systems Thinking Elements	• What affects what? Printing habits → paper demand → forest and energy use → waste collection → fibre recovery. • Where does waste or impact leak? One-sided sheets are discarded, unnecessary copies are printed, contaminated paper enters recycling, and recycled-content products are not purchased. • What small intervention could make a big difference? Default double-sided printing, a one-sided paper station, and simple sorting guidance at the point of disposal.

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Teacher-led (5 min)

Show a clean sheet, a one-sided used sheet, a crumpled sheet, and a contaminated paper item.

Ask: "Do all of these have the same next life?"

- **Tools:** Real paper samples, projector.
- **Method:** Object-based visual trigger.

Individual observation (5 min)

Students examine their bag or desk and list paper items they used today. They mark each as necessary, reusable, recyclable, or avoidable.

- **Tools:** Paper-use snapshot card.
- **Method:** Personal material inventory.

Pair work (5 min)

Pairs compare lists and choose one example where the value of paper was lost too early.

Prompts: "Could it have been digital?" "Could the reverse side be used?" "Was it sorted correctly?"

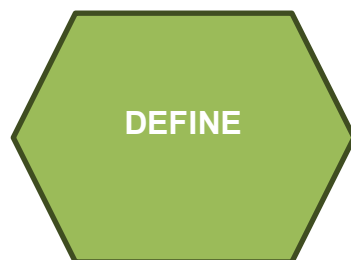
- **Method:** Think-Pair-Share.

Whole-class discussion (5 min)

Create a class map: refuse → reduce → reuse → recycle → purchase recycled content.

- **Tools:** Board, samples, sticky notes.
- **Output:** Shared understanding that a closed loop needs both collection and demand for recycled products.

Teacher-led → Individual observation → Pair work → Whole-class discussion



Teacher-led framing (5 min)

Explain the paper fibre journey and why fibres shorten each time they are recycled. Introduce contamination and the importance of keeping paper clean and dry.

- **Tools:** Fibre-cycle diagram and sorting examples.

Group “Paper Trail Audit” (3–4 students) (10 min)

Each group studies one paper stream: worksheets, office printing, art paper, notebooks, packaging, or paper towels.

Student prompts:

1. Why is this paper used?
2. How much is used in a typical day or week?
3. Is it printed on one or both sides?
4. Can it be reused before recycling?
5. What prevents correct sorting?
6. Does the school buy products containing recycled fibres?

- **Tools:** Sample items, tally sheet, optional scales or counts, school bin photographs.

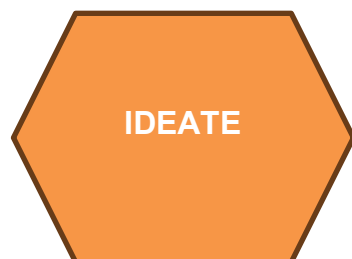
- **Method:** Material-flow analysis.

Whole-class sharing (5 min)

Groups identify one recurring leak. The teacher clusters findings: unnecessary use, poor reuse, confusing bins, contamination, purchasing gap.

- **Output:** One challenge statement: “How might we keep paper fibres useful for longer by ...?”

Teacher-led framing → Group “Paper Trail Audit” → Whole-class sharing



Divergent brainstorming (5 min)

Groups generate ideas for reducing printing, reusing sheets, improving collection, or choosing circular paper products.

Teacher prompts:

- “What could be refused completely?”
- “How could one-sided sheets become a useful resource?”
- “How could sorting instructions appear exactly where needed?”
- “How could digital tools reduce rather than increase duplication?”
- **Tools: Sticky notes, A3 sheet, Miro.**

Sharing and clustering (5 min)

Sort ideas into: refuse, reduce, reuse, sort, buy circular.

Guiding questions: “Which idea preserves the sheet before recycling?” “Which closes the loop after collection?”

Decision matrix (5 min)

Score ideas from 1–3 for paper avoided, ease of use, inclusion, cost, and measurability. Select one concept.

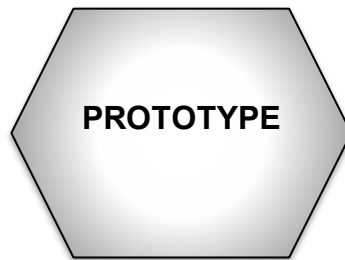
- **Tools: Printed matrix or spreadsheet.**

Whole-class check-in (5 min)

Each group gives a 30-second pitch: paper stream + value leak + selected intervention.

Expected Output: One justified concept ready to prototype.

Divergent brainstorming → Sharing and clustering → Decision matrix → Whole-class check-in



Group prototyping (10 min)

Create one of the following:

- a one-sided paper collection and redistribution station;
- a clear bin label and sorting guide;
- a print-request or double-sided default system;
- a notebook, art pad, or draft booklet made from reclaimed sheets;
- a campaign showing the complete paper loop.

The prototype must explain who uses it, where it belongs, and what happens next.

- **Tools: Reclaimed paper, cardboard, markers, binders, Canva or Figma.**

Group refinement (5 min)

Add a “fibre value” checklist:

- What paper is avoided?
- What paper is reused?
- What remains recyclable?
- How is contamination prevented?

Teacher walk-around and nudging (3 min)

Prompts: “Does the solution make the preferred action easiest?” “What happens when the station is full?” “Who maintains the loop?”

Individual reflection note (2 min)

“One paper habit I could change is...”

“Our solution keeps fibres useful by...”

Expected Output: Labelled prototype and individual reflection.

Group prototypin → Group refinement → Teacher walk-around and nudging → Individual reflection note

	Peer feedback carousel (5 min) Groups test their prototype with another group. Partners use three checks: 1. Is the action immediately clear? 2. Does it prioritise reduction and reuse before recycling? 3. Is responsibility for the next step visible? Feedback format: 2 strengths + 1 practical improvement. • Tools: Feedback slips or Google Form. Group refinement (5 min) Groups add one visible improvement and complete: "Our solution prevents paper from becoming waste too soon by..." Teacher guiding: "Could a new student understand it?" "Does the system work on a busy school day?" Expected Output: Improved prototype and simple impact measure. Peer feedback carousel → Group refinement
Assessment & Reflection	Exit ticket: • "One action that is better than recycling paper is..." • "One reason clean and dry sorting matters is..." • Self-assessment: I used evidence / hierarchy thinking / clear communication (choose two and explain).
Inclusion Strategies (UDL)	How will SEN/ELL learners be supported? • Clear instructions. Use short steps, icons, and demonstrations. • Concrete materials. Students handle and classify real paper samples. • Language scaffolds. Sentence starters: "This paper can be...", "The value is lost when...", "Our system makes it easier to..."

	• Flexible output. Students may build, draw, photograph, record audio, or use short labels. • Check-ins. Teacher confirms that students distinguish reuse from recycling. What adaptations will be offered? Visuals • Picture sequence of the paper fibre loop. • Sorting cards with clean, contaminated, reusable, and non-paper examples. Scaffolds • Partly completed paper-audit tally and decision matrix. • R-strategy prompt cards. Group roles • Auditor, sorter, recorder, designer, presenter. Language supports • Bilingual word bank and translation tools. • Model pitch and option to present with a partner.
Real-World Connection / Impact	Who will see or use this work (class, school, parents, community)? What real change could this activity create in school or daily life? The prototypes can be tested in classrooms, the staff room, library, or school office and shared with teachers, the student council, and families. A corridor display can show the journey of one sheet through several useful lives. The activity can lead to default double-sided printing, shared digital routines, reclaimed-paper stations, better bin labels, or student-made draft notebooks. A weekly count or weight of paper can provide evidence of change, while purchasing decisions can include recycled-content and certified paper.

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	In daily life, students learn that putting paper in a recycling bin is not the first or final answer. The central impact is a practical shift toward using less, using each sheet fully, sorting correctly, and supporting markets for recovered fibres.
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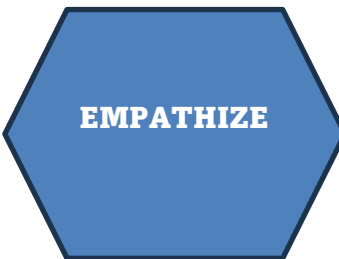
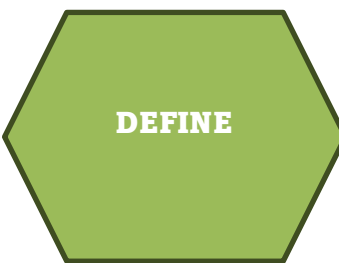
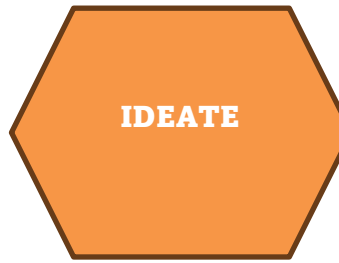
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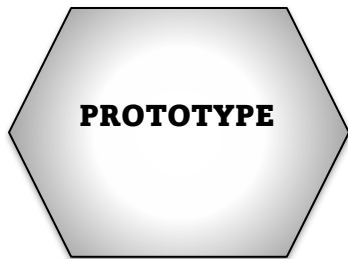
GREEN LOOP LESSON PLAN

Lesson Title	PET Comes to Life – From Waste to Resource
Curriculum Link / Subject	Science, Visual Arts, ICT, Civic Education
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☒ Repair ☒ Recycle
Teacher	Lucaciu Anca Maria
Grade Level	7-8
Time/Duration	90 minutes
Objectives	Academic/subject /thinking skills objectives Students identify PET pollution, analyze causes, collaborate, and create solutions.
	Sustainability/Circular Objectives Students understand the circular economy and propose reuse solutions.
Systems Thinking Elements	• What affects what? • Where does waste or impact leak? • What small intervention could make a big difference? Trends and consumption create waste; reuse and recycling reduce impact.

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	• <i>Teacher Role:</i> Teacher facilitates role-play, interviews, or observation to explore user needs and problems. • <i>Student Role:</i> Students share perspectives, collect data, and discuss real experiences. • <i>Tools/Materials:</i> Padlet, interviews, photos. Video + discussion + role play to explore PET bottle life cycle.
	• <i>Teacher Role:</i> Teacher guides students to frame the core problem as a clear “How might we...?” question. • <i>Student Role:</i> Students define problem: How might we give PET bottles a second life? • <i>Tools/Materials:</i> Whiteboard, Google Docs, Padlet, photos, etc • <i>Expected Output:</i> Problem statement.
	• <i>Teacher Role:</i> Teacher encourages brainstorming and divergent thinking without judgment. • <i>Student Role:</i> Students generate multiple creative ideas, then prioritise top 1–2. • <i>Tools/Materials:</i> Sticky notes, Miro, Canva. • <i>Expected Output:</i> Students brainstorm solutions (object, decoration, campaign).

 PROTOTYPE	<i>Teacher Role:</i> Teacher supports students in creating draft solutions in simple, tangible forms. <i>Student Role:</i> Students create posters, models, mock apps, or campaign materials. <i>Tools/Materials:</i> Canva, Flip, paper, markers, digital apps. <i>Expected Output:</i> Students create objects using PET bottles.
 TEST & ITERATE	<i>Teacher Role:</i> Teacher organises peer feedback sessions and encourages revisions. <i>Student Role:</i> Students present their solution, receive feedback, and refine their design. <i>Tools/Materials:</i> Peer feedback forms, Google Forms, Flip, Padlet. <i>Expected Output:</i> Students present work and receive peer feedback.
Assessment & Reflection	- Teacher: Observation - Peer feedback (structured form or comments) - Student self-reflection (journal, Flip video, exit ticket)
Inclusion Strategies (UDL)	- How will SEN/ELL learners be supported? - What adaptations (visuals, scaffolds, group roles, language supports) will be offered? Movement, visuals, group work, choice, sentence starters.
Real-World Connection / Impact	- Who will see or use this work (class, school, parents, community)? - What real change could this activity create in school or daily life? Students apply learning to daily habits and sustainability actions.

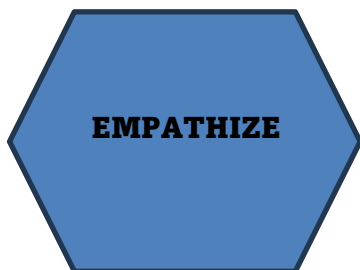
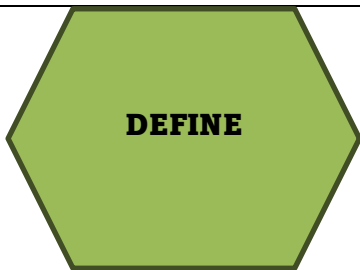
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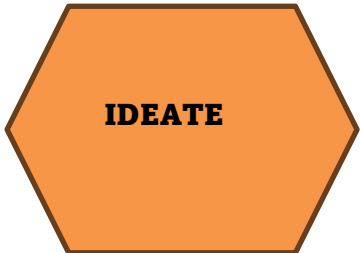
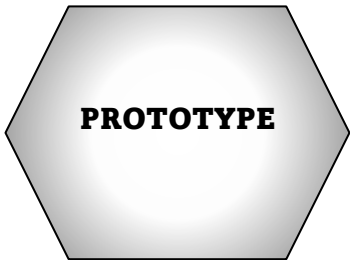
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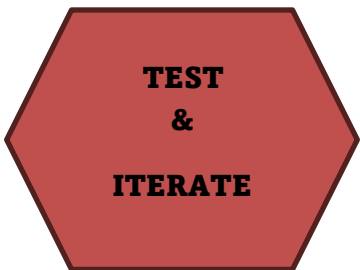
GREEN LOOP LESSON PLAN

Lesson Title	From Waste to Resource – Exploring the Circular Economy
Curriculum Link / Subject	Science, Civic Education, Technology Education, Geography Aligned with the Romanian curriculum: • Science (Grade 6): Environment and human health, energy and resources • Civic Education (Grade 7): Responsible citizenship, sustainable communities • Technology: Efficient use of materials and sustainable design • Geography: Natural resources and human–environment interaction
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☒ Repair ☒ Recycle
Teacher	Mrs. Fabiola Goicovici
Grade Level	6 th -8 th graders
Time/Duration	3–4 lessons (approximately 3–4 hours total)
Objectives	Academic/subject /thinking skills objectives • Analyze how products are used and disposed of • Understand the difference between linear and circular systems • Collaborate in groups to solve a real-world problem • Develop creative and critical thinking through design
	Sustainability/Circular Objectives

	Students will: • Identify waste in everyday products • Explain circular economy principles • Propose reuse and upcycling solutions • Reflect on personal consumption habits
Systems Thinking Elements	What affects what? • Consumption habits → waste production • Product design → environmental impact • Human choices → sustainability Where does waste or impact leak? • Single-use products • Lack of reuse or repair • Poor waste management What small intervention could make a big difference? • Reusing products • Repairing items • Upcycling materials

	• <i>Teacher Role:</i> Introduces topic through video and discussion Facilitates brainstorming and product analysis • <i>Student Role:</i> Reflect on waste and consumption Analyze everyday products Discuss real-world impact • <i>Tools/Materials:</i> Short video on circular economy Venn diagram worksheet Classroom discussion Everyday objects (bottles, clothes, jars, containers) Expected Output Understanding of linear vs circular economy Identification of waste problems
	• <i>Teacher Role:</i> Guides students to identify the core problem • <i>Student Role:</i> Define the problem based on analysis Example Problem Statement “How might we reduce waste by giving everyday products a second life?”

	<i>Tools/Materials:</i> Sticky notes, Brainstorming board, Product lifecycle worksheet <i>Expected Output:</i> Clear group problem statement
 IDEATE	<i>Teacher Role:</i> Encourages brainstorming and creative thinking. Provides structure (planning sheet) <i>Student Role:</i> Students generate ideas on how to reuse or transform waste objects into useful items. Select the best solution <i>Tools/Materials:</i> Sticky notes, brainstorming board, group discussion <i>Expected Output:</i> Selected idea for project
 PROTOTYPE	<i>Teacher Role:</i> Facilitates hands-on work. Provides feedback and guidance. Ensures safety <i>Student Role:</i> Create a product from waste materials. Apply circular principles <i>Tools/Materials:</i> ✓ Old clothes ✓ Jars and containers ✓ Boxes ✓ Scissors, glue, tape, markers, string, etc <i>Expected Output:</i> A functional or creative upcycled product

	• <i>Teacher Role:</i> Organises a gallery walk and peer feedback session. Guides reflection • <i>Student Role:</i> Students present their projects, give and receive feedback from classmates, and discuss improvements. Activity • Gallery walk • Peer feedback: ○ One thing I liked ○ One suggestion • <i>Tools/Materials:</i> ✓ Sticky notes for feedback ✓ Reflection questions ✓ Presentation materials • <i>Expected Output:</i> Improved ideas and reflection on sustainability.
Assessment & Reflection	Assessment methods include: • ? Venn diagram (concept understanding) • ? Product lifecycle chart (real-world application) • ? Upcycling project (creativity and collaboration) • ? Group presentation (communication) • ? Written reflection (personal insight)

	Students reflect on questions such as: • What did I learn? • What surprised me? • What will I change?
Inclusion Strategies (UDL)	Support strategies may include: <i>Visual materials (video, diagrams)</i> <i>Group collaboration</i> <i>Hands-on activities</i> <i>Choice in project type</i> <i>Sentence starters:</i> Our idea is... This helps because... This reduces waste by...
Real-World Connection / Impact	Students connect learning to: • daily consumption habits • waste management • environmental responsibility Possible extensions: • school exhibition • upcycling campaign

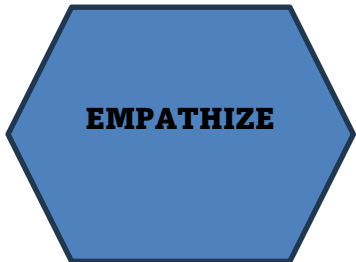
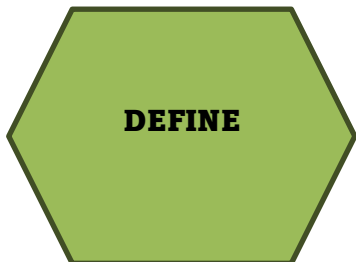
	• community involvement Possible broader impact: • School upcycling challenge • Environmental awareness in the school community • Inspiration for reducing waste in daily life
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GREEN LOOP LESSON PLAN

Lesson Title	What Does Your Closet Say About You?
Curriculum Link / Subject	Social Studies / Personal Development / Sustainability / Design Thinking
Circular Economy Theme	☐ Refuse ☒ Reduce ☒ Reuse ☒ Repair ☐ Recycle
Teacher	Goicovici Fabiola
Grade Level	13-15 years old
Time/Duration	90 minutes
Objectives	Academic/subject /thinking skills objectives - Analyze personal fashion habits and social influences - Collaborate in groups - Develop creative communication through posters, skits, or campaigns
	Sustainability/Circular Objectives - Understand circular fashion - Identify how fashion habits create waste - Suggest ways to reuse, repair, restyle, and share clothes
Systems Thinking Elements	What affects what? - Social media, trends, peer pressure, influencers Where does waste leak? - Buying too often, not repeating outfits, following trends too quickly

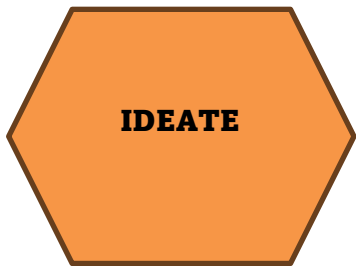
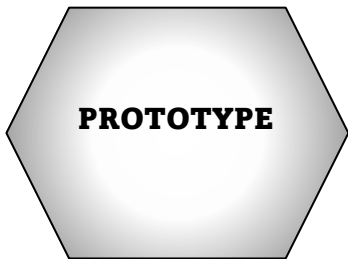
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	What small intervention could make a big difference? - Rewearing outfits, styling clothes differently, repairing items, sharing clothes
	Teacher Role: Facilitates movement games and discussion. Student Role: Students reflect on fashion habits and social pressure. Tools/Materials: A/B/C/D signs, board, projector. Expected Output: Students identify their fashion personality type.
	Teacher Role: Guides students to identify a shared problem. Student Role: Students discuss their habits and define a challenge. Tools/Materials: Board, markers. Expected Output: "How might we use our clothes better without buying more?"

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 IDEATE	Teacher Role: Encourages brainstorming and creativity. Student Role: Students generate ideas to make their fashion type more circular. Tools/Materials: Paper, sticky notes, markers. Expected Output: List of creative solutions.
 PROTOTYPE	Teacher Role: Supports students while they create. Student Role: Students create posters, TikTok ideas, skits, or outfit concepts. Tools/Materials: Paper, markers, Canva, poster sheets. Expected Output: A visual or performance-based prototype.

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	Teacher Role: Facilitates presentations and peer feedback. Student Role: Students present, receive feedback, and improve ideas. Tools/Materials: Peer comments, class discussion. Expected Output: Improved solution idea.
Assessment & Reflection	- Teacher observes participation and collaboration - Peer feedback: one thing that worked + one improvement - Student reflection: “What could I change about my fashion habits?”
Inclusion Strategies (UDL)	- Movement-based activity - Visual posters and slides - Group work and peer support - Choice in final product - Sentence starters on board
Real-World Connection / Impact	Students connect fashion habits to everyday life. They consider how their choices affect waste and sustainability. Their work could be shared in class, around school, or on social media.

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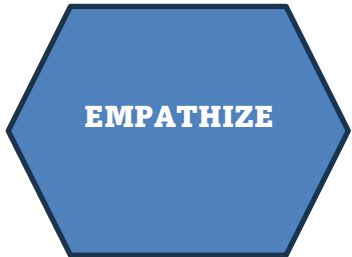
GREEN LOOP LESSON PLAN

Lesson Title	EcoMould innovators: designing waste into value
Curriculum Link / Subject	Interdisciplinary learning: Science, Design & Technology, Environmental Education, Language & Communication, Civic Education, Digital Competence
Circular Economy Theme	☐ Refuse ☒ Reduce ☒ Reuse ☐ Repair ☒ Recycle
Teacher	Buliga-Stochițoiu Roxana
Grade Level	Lower Secondary (ages 10-14)
Time/Duration	Session 1 (50 min) • Empathize – 20 min • Define – 30 min Session 2 (60 min) • Ideate – 30 min • Material Matrix – 15 min • Planning – 15 min Session 3 (90 min) • Prototype – 45 min • Test & Iterate – 20 min • Present & Reflect – 25 min
Objectives	Academic/subject /thinking skills objectives • explain differences between linear and circular economy models using school-based examples. • analyse the life cycle of one everyday school product and identify waste points.

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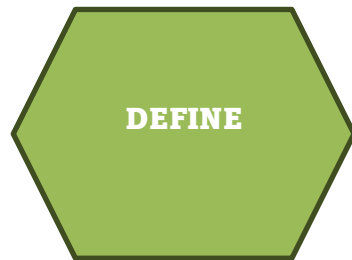
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	• design and build a functional prototype from recycled EcoMould materials. • evaluate their prototype using sustainability, usefulness, feasibility, and creativity criteria. • communicate ideas clearly through oral presentation, visuals, and written reflection.
Systems Thinking Elements	Sustainability/Circular Objectives Students will be able to: • recognise waste as a resource with new potential value; • explain two ways reusing materials reduces pollution and resource consumption; • design and construct one alternative to a plastic-based school item; • propose one sustainable habit change for school life; • connect local actions with global environmental goals; • evaluate how everyday choices affect long-term sustainability. What affects what? Material choices influence waste, costs, product lifespan, and environmental impact. Where does waste or impact leak? Single-use plastics, unnecessary packaging, short product life cycles, poor recycling habits. What small intervention could make a big difference? Replacing disposable school items with student-made reusable eco-products.

	Mini inquiry: School plastic waste survey (10 min) Students complete a quick survey about the most used disposable plastic items in school (bottles, wrappers, folders, pens, packaging, cups). Tool: Mentimeter live poll + results analysis Output: Live graph of class responses. Students explore real needs in school life by observing daily classroom routines and identifying common problems related to waste and organisation. Learning activities Classroom observation: What school items are overused, broken, wasted, or made from plastic? Quick interviews with classmates: What school tools would help you most? Photo prompts or object exploration: pencil holders, labels, trays, organisers, erasers (Appendix 1). Discussion: Why do we buy new things instead of redesigning old materials? Teacher Role Facilitates inquiry, asks guiding questions, encourages curiosity, supports evidence gathering. Student Role Observe, discuss, listen actively, identify user needs, collect ideas. Tools / Materials Used school supplies, recycled objects, Padlet, sticky notes, notebooks, photos. Expected Output List of real classroom problems and user needs.

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Mini systems thinking activity: Journey of a plastic pen (15 min)

Students work in teams and map the life cycle of a plastic pen:

Raw material → Factory → Transport → Shop → School use → Waste → Pollution

Then students compare it with a possible EcoMould product:

Waste paper → Recycled process → Student creation → Classroom use → Reuse / Compost / Low waste

Guiding questions:

- Where does waste leak into the system?
- Which stage creates the most impact?
- Where can we intervene?
- Which product has lower environmental impact?

Expected output:

A simple lifecycle comparison chart or poster.

Students use collected evidence to identify the most urgent waste stream to redesign.

Waste audit challenge

Teams collect data for one school day:

- number of plastic bottles
- snack wrappers
- broken pens
- paper waste
- packaging items

Output:

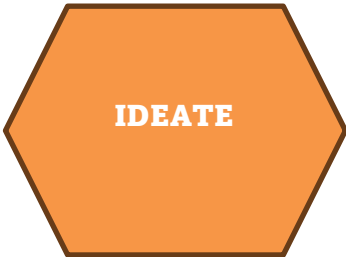
Simple totals chart.

Students synthesise findings and frame a clear design challenge.

Core question

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	How might we design useful, attractive, low-cost school objects from recycled materials using eco-moulding paste? Teacher Role Guides students to prioritise realistic problems and transform ideas into a focused challenge. Student Role Compare findings, identify priorities, agree on one challenge per team. Tools / Materials Whiteboard, chart paper, Google Docs, sticky notes. Expected Output Written problem statement and success criteria.
	Students generate multiple potential solutions through structured creative and critical thinking strategies. • Brainstorming (quantity before quality): students generate as many ideas as possible without judging or rejecting them. The focus is on creativity and free thinking. • Think–Pair–Share: students first think individually about possible solutions, then discuss their ideas with a partner, and finally share them with the whole class. • SCAMPER strategy: students improve or create ideas by asking guided questions: <i>Substitute</i> – What can be replaced? <i>Combine</i> – What can be joined together? <i>Adapt</i> – What can be adjusted or copied from another idea? <i>Modify</i> – What can be changed or improved? <i>Put to another use</i> – Can it be used differently? <i>Eliminate</i> – What can be removed or simplified? <i>Reverse</i> – What can be rearranged or turned around? • Mind mapping design possibilities: students organise ideas visually by connecting the main problem to possible products, materials, and features. • Ranking ideas: Students evaluate their ideas and choose the best one based on:

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Usefulness – Does it solve a real problem?
Sustainability – Is it environmentally friendly?
Originality – Is it creative and innovative?
Feasibility – Can it realistically be made and used?

Possible product ideas

- Pencil holder
- Desk organiser
- Name tag
- Paperweight
- Mini tray
- Bookmark stand
- Plant pot
- Classroom storage labels

Teacher Role

Encourages divergent thinking, ensures every student contributes, promotes respectful collaboration.

Student Role

Generate ideas, sketch concepts, compare options, select the strongest solution.

Tools / Materials

Miro collaborative idea board, paper, pencils, markers, sticky notes.

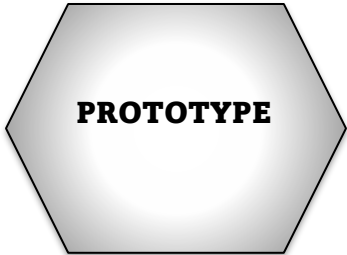
Expected Output

Idea board + labelled design sketch.

Before building their products, students take part in a *Material decision matrix* activity (*Appendix 2*). This helps them compare possible materials and make informed design choices based on clear criteria rather than guesswork. Working in teams, students analyse each material according to durability, cost, recycled content, biodegradability, and safety.

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	They discuss the strengths and limitations of plastic, cardboard, EcoMould, and wood, then decide which material is most suitable for their product. This process develops critical thinking, decision-making, and sustainability awareness while modelling how real designers select materials. Expected impact Students justify their design choices using evidence and sustainability criteria.
	Students transform ideas into tangible products using eco-moulding paste. EcoMould recipe • shredded paper • water • flour or white glue • optional natural colouring (turmeric, beetroot, cocoa) Learning activities 1. Prepare EcoMould mixture. 2. Shape product using hands or moulds. 3. Reinforce structure if needed using cardboard or reused materials. 4. Add design features (texture, compartments, handles, labels). 5. Leave product to dry. 6. Create a digital version in Tinkercad 3D mock-up. Design criteria • Useful • Stable • Safe • Attractive • Sustainable • Realistic to produce Teacher Role

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	Supports experimentation, demonstrates safe techniques, gives formative feedback. Student Role Build, test, improve, solve problems, manage roles responsibly. Tools / Materials Bowls, spoons, recycled paper, glue/flour, cardboard, scissors, paints, rulers. Expected Output Functional prototype. After creating their prototype, students complete a <i>Budget & Feasibility Check</i> to evaluate whether their eco-product could realistically replace commercial alternatives. They compare the estimated cost of a factory-made product with the cost of producing their EcoMould version. This stage introduces entrepreneurial thinking by encouraging learners to evaluate sustainability alongside affordability and practical implementation. Learners reflect on how schools can reduce costs while making environmentally responsible choices. Reflection prompt Can schools save money by using student-designed eco products? Why or why not? Expected Impact Students connect sustainability, innovation, and economic feasibility in a real-world context.
	Students present products, receive feedback, and improve designs. Peer review questions 1. Is the product useful? 2. Is it durable enough? 3. Is it creative and attractive? 4. Does it reduce waste? 5. Could it be used in real school life? 6. What would you improve?

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	Iteration process • Modify shape • Strengthen weak areas • Improve appearance • Simplify use • Reduce materials used • Add clearer purpose Teacher Role Organises feedback sessions, models constructive critique, guides redesign decisions. Student Role Present confidently, listen to feedback, revise prototype, justify improvements. Tools / Materials Padlet Expected Output Improved prototype with documented changes.
Assessment & Reflection	Teacher rubric / checklist: creativity, feasibility, sustainability, teamwork, presentation, and problem-solving. Peer feedback: structured comments provided during the Test & Iterate phase and after final presentations. Student self-reflection: exit ticket + reflection on challenges, improvements, and learning outcomes. Group Presentation Each group presents its eco-product prototype to the class. They should explain: • the materials used and why they were selected; • the key features of the design and how they support sustainability and practicality; • how the product could function in real school life (classroom, library, desk organisation, school events);

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- any innovative elements that make the product unique or more effective.

Peer and Teacher Feedback

After each presentation, the class provides feedback on:

- the sustainability of the materials used;
- the creativity of the solution;
- the feasibility of the product for real use;
- suggestions for improvement and further development.

Reflection & Discussion

Padlet Digital Reflection Wall

Students respond to prompts such as:

- What did I learn about sustainable design?
- What was the biggest challenge in our team?
- How could our prototype be improved?
- How can eco-design help our school community?

Class Feedback

The teacher and students engage in collaborative evidence-informed decision-making to identify how each design could be improved or adapted. Discussion highlights:

- material selection
- sustainability impact
- ease of use
- affordability
- long-term usefulness

Real-World Outcome

The most feasible solution can be proposed for implementation in the school through an eco-club project, classroom use, or sustainability exhibition.

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Inclusion Strategies (UDL)	SEN/ELL learners are supported through visual instructions, model examples, guided questioning, structured routines, and peer collaboration in mixed-ability groups. Clear step-by-step guidance helps learners access tasks with confidence and independence. Adaptations offered: • vocabulary support with key words, visuals, and sentence starters; • flexible product formats (model, drawing, poster, digital prototype, oral explanation); • clearly assigned group roles (designer, builder, presenter, recorder, timekeeper); • scaffolded mind maps and problem-solving templates; • teacher check-ins and additional processing time where needed; • multimodal expression so students can show learning in different ways.
Real-World Connection / Impact	Audience: classmates, teachers, the eco-club, school leadership, parents, and the wider school community. Impact: the most feasible eco-product design can be selected for real implementation in classrooms or school projects. Student creations may reduce waste, replace less sustainable items, promote responsible habits, and inspire a culture of innovation and environmental responsibility across the school community.

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Appendix 1



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Appendix 2

Material decision matrix

Students compare possible materials (plastic, cardboard, EcoMould) using a scoring table based on cost, recycled content, safety, durability, and biodegradability. In teams, they analyse results and justify which material best suits their chosen product.

Expected Output:

Evidence-based material choice + design justification.

Material	Durable	Cheap	Recycled	Biodegradable	Safe
Plastic	High	Medium	Low	No	Yes
Cardboard	Medium	High	Yes	Yes	Yes
EcoMould	Medium	High	Yes	Yes	Yes
Wood	High	Medium	Yes	Yes	Yes

Material	Cost	Recycled	Safe	Durable	Biodegradable
Plastic	2	1	2	5	0
Cardboard	5	4	4	2	4
EcoMould	4	5	5	3	5

Then students explain why they chose their material.

Product	Factory Version	Eco-Mould Version	Better Choice?
Pencil Holder	€3	€0.50	EcoMould
Name Tag	€1	€0.20	EcoMould
Desk Tray	€5	€1	EcoMould

Budget & Feasibility Check

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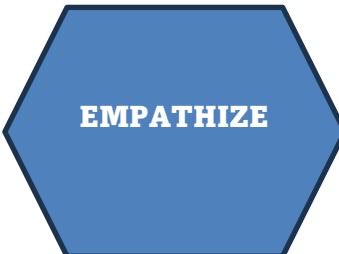
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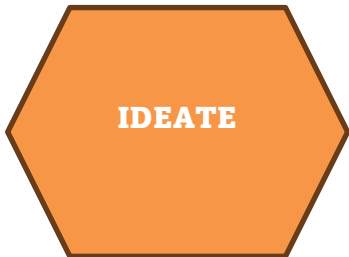
GREEN LOOP LESSON PLAN

Lesson Title	Designing tomorrow: greenpreneurs in action!
Curriculum Link / Subject	English language, Mathematics, Sciences (Physics, Chemistry, Biology), Geography, Technological Education and Practical Applications, Civic / Social Education, Counseling and Career Guidance, Financial literacy
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☒ Repair ☒ Recycle
Teacher	Buliga-Stochitoiu Roxana
Grade Level	7 th
Time/Duration	90 min
Objectives	Academic/subject /thinking skills objectives: 1.to identify the key principles of the circular economy and sustainable development; 2.to analyze the difference between a linear economy and a circular economy; 3. to explain how their eco-business model demonstrates responsible resource management and contributes to the achievement of sustainable development goals.
	Sustainability/Circular Objectives: 1. to adopt the role of eco-entrepreneurs and design at least one small-scale sustainable business model within given financial and material constraints; 2.to reflect on resource use by identifying at least three concrete strategies for saving energy, reducing waste, or reusing materials; 3.to practice collaborative problem-solving by working in groups of 4–5 to produce a joint eco-business canvas that integrates at least one circular economy principle.

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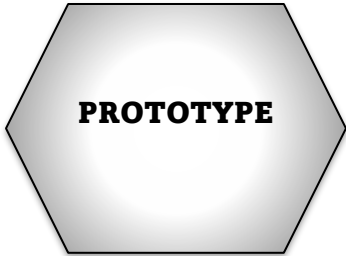
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Systems Thinking Elements	• What affects what? Entrepreneurial choices affect environment, society, and economy. • Where does waste or impact leak? Overuse of resources, pollution, inefficient energy use. • What small intervention could make a big difference? Using renewable energy, reusing materials, community impact projects.
	• <i>Teacher Role:</i> facilitates role-play, interviews, or observation. Introduces the <i>Mystery Object Box</i> to spark curiosity and creative thinking, prompting students to link everyday items to sustainability concepts. • <i>Student Role:</i> Share perspectives, assume defined group roles (eco-designer, budget manager, communicator, evidence keeper), and collaboratively brainstorm how discarded objects can be reused, repurposed, or redesigned. • <i>Tools/Materials:</i> <i>Mystery Object Box</i> (plastic bottle, old T-shirt, tin can, old magazine), sticky notes, markers, Mentimeter for polling, Padlet for idea-sharing. Output: Awareness of linear vs circular economy, creative ideas for reuse.
	• <i>Teacher Role:</i> Guides students in analysing the <i>Eco-Facts Sheet</i> to identify pressing environmental issues at local, national, or global levels. Supports them in turning raw data into a clear, evidence-based problem statement and facilitates the creation of a collective <i>Problem Wall</i>. • <i>Student Role:</i> Act as eco-investigators: extract relevant evidence from the <i>Eco-Facts Sheet</i>, transform it into a concise problem statement, and place it on the <i>Problem Wall</i> using sticky notes. Ensure that the chosen evidence is explicitly referenced in their

	team's visual identity (poster/logo) and acknowledged during the eco-business presentation. • <i>Tools/Materials:</i> Whiteboard, sticky notes, <i>Eco-Facts Sheet</i> (Appendix F). • <i>Expected Output:</i> A clearly formulated, data-driven problem statement linked to environmental issues, visibly displayed on the <i>Problem Wall</i> and serving as the foundation for each group's eco-business design.
	• <i>Teacher Role:</i> Encourages divergent thinking and open brainstorming of eco-business solutions. Prompts students with guiding questions (e.g., <i>How does your business reduce waste? How does it balance costs with environmental impact?</i>), and supports them in refining and prioritising their most feasible ideas. • <i>Student Role:</i> Collaboratively generate multiple creative business ideas grounded in evidence from the <i>Problem Wall</i>. Discuss, compare, and evaluate options before selecting the top idea to develop further. Begin outlining their eco-business model using the <i>Eco-Business Canvas</i> (Appendix G). • <i>Tools/Materials:</i> Sticky notes for brainstorming, <i>Eco-Business Canvas</i> template (Appendix G), guiding questions from the teacher. • <i>Expected Output:</i> An <i>Idea Board</i> with a variety of proposed eco-business solutions and a first draft of the group's eco-business model clearly linked to the identified problem.
	• <i>Teacher Role:</i> Supports students in transforming their selected idea into a tangible prototype. Facilitates decision-making about limited resources (10 coins) and guides them in balancing environmental sustainability, social responsibility, and economic viability. Encourages creativity in both the eco-business model and its visual representation.

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 PROTOTYPE	• <i>Student Role:</i> Collaboratively design their eco-business using the <i>Eco-Business Canvas</i>. Allocate their budget of 10 coins through the <i>Classroom Resource Shop Menu</i>, making trade-offs between cheaper but less sustainable options and more eco-friendly alternatives. Create a visual identity (logo, poster, or slogan) that communicates both their business idea and its link to the evidence chosen earlier. • <i>Tools/Materials:</i> Laptop, large paper, crayons, markers, scissors, glue, coins, <i>Classroom Resource Shop Menu</i> (Appendix G), eco-bonus guidelines. • <i>Expected Output:</i> A complete <i>Eco-Business Canvas</i> with clearly defined budget choices, sustainability strategies, and a creative visual identity that connects the business idea to evidence from the <i>Problem Wall</i>.
 TEST & ITERATE	• <i>Teacher Role:</i> Organises structured peer-feedback sessions following group presentations. Facilitates discussion by asking probing questions (e.g., <i>How does this idea benefit the community? What trade-offs did the team manage?</i>), and encourages students to refine their ideas based on constructive feedback. Recognises and celebrates outstanding contributions through class awards. • <i>Student Role:</i> Present their eco-business concept in a concise 3–4 minute pitch, clearly explaining their product/service, sustainability strategies, and evidence link. Listen actively to peer and teacher feedback, respond to questions, and refine their eco-business model accordingly. Participate in peer evaluation to acknowledge creativity, practicality, and impact. • <i>Tools/Materials:</i> Peer feedback forms, Padlet for collective reflection, classroom discussion prompts, recognition categories (Most Creative Idea, Most Practical Business, Greatest Positive Environmental Impact).

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	<i>Expected Output: An improved eco-business concept refined through peer and teacher feedback, along with peer recognition highlighting innovative, practical, and impactful contributions.</i>
Assessment & Reflection	- Teacher rubric or checklist: uses a rubric or checklist to evaluate <i>creativity, sustainability, problem-solving, collaboration, and presentation skills</i>. Provide targeted feedback that highlights both strengths and areas for improvement. - Peer feedback (structured form or comments): students evaluate each group's eco-business using Padlet or structured feedback forms, focusing on practicality, creativity, and community impact. Recognition categories (e.g., <i>Most Creative Idea, Most Practical Solution, Greatest Positive Environmental Impact</i>) reinforce positive peer assessment. - Student self-reflection (journal, Flip video, exit ticket): Each student responds individually on Padlet (or in a reflection journal) to the following prompts: <i>How could our eco-business idea be made more eco-friendly, practical, or innovative?, What was the hardest trade-off our team faced when designing the eco-business?, In one word, how would you describe how you felt during this activity?</i>
Inclusion Strategies (UDL)	Support for SEN/ELL learners: Provide clear roles within groups (eco-designer, budget manager, communicator, evidence keeper) to ensure equitable participation. Offer visuals such as the <i>Eco-Business Canvas</i> and posters to support comprehension. Scaffolds: Use sentence starters, guiding questions, and structured templates to help students express their ideas clearly and confidently. Language Supports: Introduce and reinforce key terms through keywords, bilingual glossaries, and visual icons to ensure accessibility for English Language Learners.

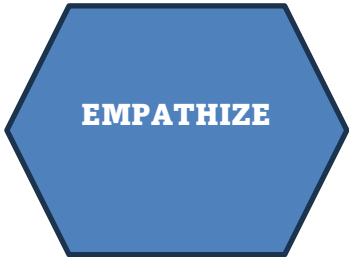
	• Collaboration & Differentiation: Encourage mixed-ability groups so that learners can support one another, and differentiate tasks according to strengths (e.g., drawing logos, budgeting, presenting). • Accessibility: Provide printed and digital resources, ensure instructions are given both verbally and visually, and allow multiple ways for students to demonstrate understanding (oral, written, visual).
Real-World Connection / Impact	• Who will see or use this work (class, school, parents, community)? Classmates, teachers, parents, the wider school community, and potentially local NGOs or businesses will engage with or benefit from the students' projects. • What real change could this activity create in school or daily life? It could increase recycling habits within the school, reduce waste, encourage more sustainable consumption (e.g., reusing, repairing), promote eco-friendly practices in families, and inspire long-term initiatives like a permanent eco-club, green school shop, or partnerships with the local community. Local-Global link: Students connect evidence from the <i>Eco-Facts Sheet</i> with broader sustainability challenges, explicitly linking their eco-business models to the United Nations Sustainable Development Goals (SDGs). Long-Term vision: Selected projects could evolve into ongoing school campaigns, cross-curricular projects, or collaborations with NGOs and local businesses, reinforcing the idea that small-scale student initiatives can inspire real change.

GREEN LOOP LESSON PLAN

Lesson Title	Waste to Worth: rethinking food
Curriculum Link / Subject	Science; Civic Education; Technology
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☒ Repair ☒ Recycle
Teacher	Buliga Stochițoiu Roxana
Grade Level	Lower Secondary (ages 10-14)
Time/Duration	Session 1 - 50 min; Session 2 - 45 min; Session 3 - 90 min
Objectives	Academic/subject /thinking skills objectives • Classify at least 3 types of waste and explain their environmental impact using examples. • Analyse food waste by identifying at least 2 causes, 2 effects, and 1 possible solution. • Design and prototype a sustainable compost bin using clear design criteria.
	Sustainability/Circular Objectives • Apply the 5Rs by proposing at least 2 practical actions in real-life contexts. • Evaluate solutions using sustainability, feasibility, and impact criteria. • Connect food waste reduction to SDG 12 and responsible consumption
Systems Thinking Elements	Consumer habits, school routines, sorting systems, and food disposal choices affect the amount of food waste produced. Waste leaks occur through leftovers, poor sorting, disposable packaging, and missed composting opportunities.

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	A practical school composting system and better waste-sorting habits can create an immediate positive impact.
	Teacher Role: Activates prior knowledge and guides observation of real or simulated school food waste. Student Role: Share experiences, classify waste types, discuss compostable materials, and map a product or food item's life cycle. Students use simple observations or collected data to support their analysis of food waste patterns. Tools/Materials: Mentimeter, short composting and circular economy videos, projector, notes, and school waste observations. Expected Output: Word cloud of waste types and a simple life cycle map with a circular redesign idea. SESSION 1 Activity 1 The main purpose is to activate prior knowledge and introduce key concepts related to waste and food systems. Method: brainstorming + guided inquiry + real-world observation Understanding waste - brainstorming to see what they know – we use Mentimeter → Students respond to the prompt: “<i>What types of waste do you know?</i>” and the results are displayed as a word cloud and briefly discussed – 5 min - introduction, discussion, types of waste – 10 min - the difference between trash and garbage - what you are allowed to use when composting – 5 min https://www.youtube.com/embed/jXHanV7ge6E?feature=oembed Students observe or reflect on school waste (real or simulated data) Use systems thinking questions: - 10 mi - What causes food waste?

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- Who is involved?
- What are the consequences?

Activity 2

Purpose: to develop systems thinking and introduce circular economy concepts through real-life examples

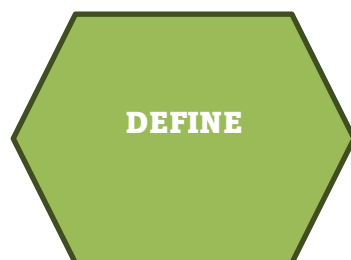
Method: storytelling + group work + visual mapping

Understanding circular economy principles

- **Storytelling: the life of a product (group work)**
 - students select a common item (their T-shirt, their water bottle)
 - steps:
 1. Pick the item
 2. Where does it come from? (raw material)
 3. How is it made? (manufacturing)
 4. How do people use it? (use)
 5. What happens when it's thrown away? Can it be recycled, composted, or upcycled? (end of life)
- now, create your own story
- watch a video explaining the circular economy and discuss key takeaways and discussions: <https://www.youtube.com/watch?v=zCRKvDyyHmI>
- “How could this product be redesigned so that it does not become waste?”
- Students create a personal “life cycle map” of one frequently consumed food item. They must include:
 - origin
 - use
 - waste stage
 - possible circular solution (reuse, compost, etc.)

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Teacher Role: Helps students frame the core challenge through systems thinking and the prompt: How might we reduce food waste in our school?

Student Role: Identify key causes, impacts, and opportunities linked to food waste and school garden needs.

Students reflect on how food waste affects not only the environment but also communities, resources, and responsible consumption behaviours.

Tools/Materials: Whiteboard, Padlet or MindMeister, sticky notes, problem map template.

Guiding questions:

- What affects what?
- Who is responsible?
- What would happen if we changed this system?

Expected Output: Shared problem map and one agreed design challenge.

Based on what we observed about waste, we now define the main problem we want to solve.

SESSION 2

Activity 3

Research & Brainstorming - Design thinking approach

- **Think-Pair-Share:**
 - We encourage students to critically think about the topic, to discuss and share insights, to collaborate
- Think (individual reflection)**
- In small groups, students discuss waste problems they have noticed in their school (e.g., plastic waste in schools, food waste at home)
- Pair (discussion in pairs)**
- They compare ideas
- Share (class Discussion)**
- Each pair shares their ideas with the whole class

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- **Mind Mapping:**

- students are introduced to the fact that we need fertilizer for our school garden, and they should find a solution for how we can use it
How might we reduce food waste?

- Each group creates a mind map of possible solutions for food waste (composting, upcycling, waste segregation, etc.)

Create a Problem Map (CAUSES–IMPACTS–OPPORTUNITIES)

Building on the problem defined in Session 2, students now move to solution design.

SESSION 3

Activity 4

Purpose:

Students identify real-world food waste problems and generate possible circular solutions using systems thinking and collaborative methods.

Method:

Think–Pair–Share + Mind Mapping + Problem Mapping (DBL – Define & Ideate stages)

The design challenge

- a role play: "The Green Company."
- students will create a prototype of a compost bin, considering the materials, design, and functionality to make it sustainable and efficient for food waste management
- Students will role-play as designers at "The Green Company", a company dedicated to providing sustainable solutions for food waste management.

What materials can we use to make our compost bin environmentally friendly and functional?

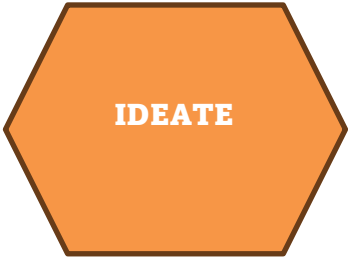
What problem do we see most often?

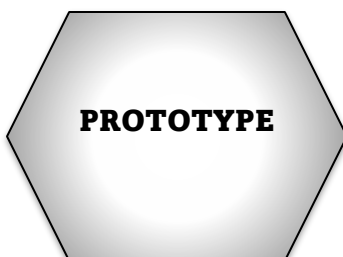
Which one should we solve first?

What makes a good compost bin (ventilation, size, accessibility, and durability)?

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	Find 3 solution categories: • prevention (reduce waste) • reuse (donation, redistribution) • recycling (composting)
	Teacher Role: Encourages brainstorming without judgment and supports solution clustering. Student Role: Generate composting, reuse, redistribution, and waste-reduction ideas, then prioritise the most promising option. Tools/Materials: Mind maps, sticky notes, Miro/Canva/MindMeister Digital tools (Mentimeter, MindMeister, Tinkercad) are used to support visual thinking, collaboration, and design development. Expected Output: Idea board with shortlisted solution categories and success criteria. Now that we understand the problem, we can start generating solutions. Research & brainstorming • materials research: a list of common materials they can consider for building the compost bin (e.g., recycled plastic, wood, bamboo, metal, cardboard, biodegradable fabrics, or other upcycled materials). Consider factors like durability, eco-friendliness, availability, and cost when choosing materials. Try to use 70% recycled materials. • key aspects that should be taken into account while designing: ○ Size (How much food waste should it handle?) ○ Ventilation (How can we ensure airflow for composting?) ○ Durability (What materials will stand the test of time in outdoor conditions?) ○ Accessibility (How can we make it easy to use? Is it portable or stationary?) ○ Sustainability (What makes the compost bin eco-friendly? Can it be made from recycled or upcycled materials?)



Teacher Role: Supports teams as they turn ideas into tangible designs and checks the use of sustainability criteria.

Student Role: Build a model, sketch, poster, or Tinkercad version of a compost bin using recycled or low-impact materials.

Tools/Materials: Cardboard, paper, scissors, glue, markers, Tinkercad, and a recycled materials list.

Expected Output: Compost bin prototype that uses at least 2 circular strategies and is suitable for school or home use.

Let's turn our ideas into real designs!

- Students can create a model or a detailed drawing of their compost bin, considering:
 - The compost bin's structure (open or closed design)
 - Placement for aeration (holes, slats, vents)
 - Compartments for different types of waste (organic, dry materials)
 - Lids or covers for easy access and odor control
 - How it will be emptied, and whether it has a turning mechanism or is a simple bin.

How will your compost bin actually work?

What makes it sustainable?

Students can also create a digital prototype using tools like Tinkercad for a 3D model.

They must take into account the success criteria:

- uses at least 2 circular strategies (5Rs)
- addresses a real food waste problem
- is feasible in a school or home context
- is clearly explained and justified

Students use tools safely and select materials responsibly, minimizing waste during prototyping.

Each group assigns roles: designer, presenter, researcher, and materials manager.

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	Teacher Role: Organises peer review and prompts revisions using the rubric. Student Role: Present prototypes, receive feedback on creativity, feasibility, sustainability, and teamwork, then improve the design. Tools/Materials: Peer feedback forms, rubric, Google Forms or Padlet, presentation notes. Expected Output: Improved prototype with at least one documented change and a brief justification. Students present their prototype to another group for peer review. Using the assessment criteria of creativity, feasibility, sustainability, and teamwork, peers give feedback and suggest improvements. Based on this feedback, each group reflects on its design and identifies at least one change that would make the compost bin more practical, sustainable, or suitable for real-life implementation in the school or community.
Assessment & Reflection	Teacher rubric/checklist: creativity, feasibility, sustainability, teamwork. Peer feedback: structured comments during Test & Iterate and presentations. Student self-reflection: exit ticket - One way I can reduce food waste - plus reflection on challenges and improvements. Group presentation: Each group presents its compost bin prototype to the class. They should explain: ○ The materials used and why they chose them ○ The features of their design and how they contribute to sustainability and practicality ○ How their compost bin will work in the real world (Is it suitable for a school, home, or community garden?) ○ Any innovative features that stand out in their design (e.g., compost bin that can be easily moved, eco-friendly materials, or composting speed improvements).

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	Peer and Teacher Feedback: After each presentation, the class provides feedback on: ○ The sustainability of the materials used. ○ The creativity of the design. ○ The feasibility of the compost bin for actual use. ○ Suggestions for improving the design. REFLECTION & DISCUSSION After the presentations, ask students to reflect on the following questions: ○ Which compost bin design was the most innovative and sustainable? ○ What challenges did they face while designing their compost bin, and how did they overcome them? ○ How can the designs be improved or implemented in real life (school, home, community)? ○ Would this work in our school? Class feedback: ○ The teacher and students discuss how each group could improve or adapt their design. Highlight aspects such as material selection, sustainability, and ease of use. ○ The most feasible solution can be proposed for implementation in the school (eco-club / garden project). Exit ticket: “One way I can reduce food waste.”
Inclusion Strategies (UDL)	SEN/ELL learners are supported through visuals, model examples, guided questions, and peer collaboration.

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	Adaptations: vocabulary support, flexible product formats (model, drawing, poster, digital prototype, oral explanation), clear group roles, and scaffolded mind/problem maps.
Real-World Connection / Impact	Audience: classmates, teacher, eco-club, school garden team, and potentially parents or the wider school community. Impact: the most feasible compost bin design can be proposed for implementation in the school garden or eco-project to reduce food waste and model sustainable habits.

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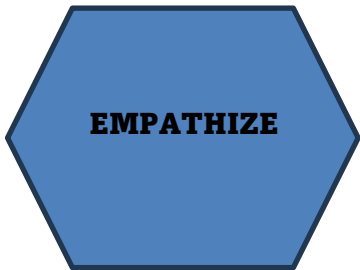
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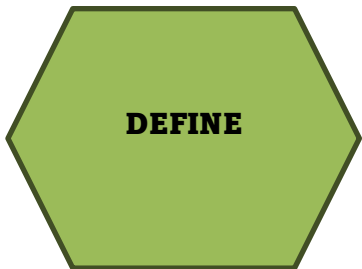
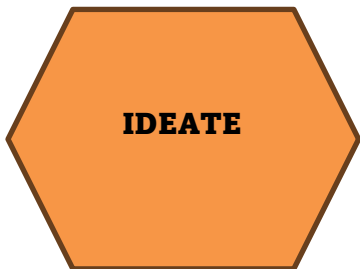
GREEN LOOP LESSON PLAN

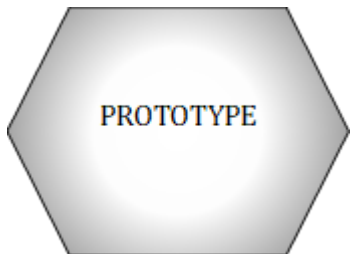
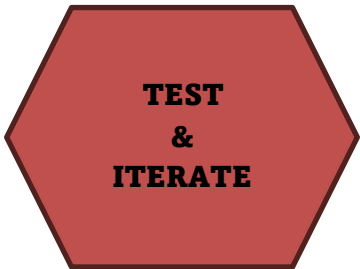
Lesson Title	Our ECO School
Curriculum Link / Subject	Environmental Education / Civic Education / Counseling and Personal Development
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☒ Repair ☒ Recycle
Teacher	Bitá Nicoleta
Grade Level	Grades 7–8
Time/Duration	90 minutes
Objectives	Academic/subject /thinking skills objectives • Developing critical and creative thinking; • Developing collaboration skills for sustainable plans.
	Sustainability/Circular Objectives • Fostering environmentally responsible behaviors; • Developing students' environmental awareness through an understanding of the Green Loop concept; • Identifying concrete solutions for transforming the school into an eco-friendly space based on recycling, reuse, and the use of alternative energy sources.
Systems Thinking Elements	What affects what? Purchasing → Consumer Behavior → Amount of Waste → Resource Management → School Costs Where does waste or impact leak? Waste of consumables → Poor waste management → Energy and water efficiency

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	What small intervention could make a big difference? Reducing purchases and fostering a sense of direct responsibility changes collective behavior more effectively than any written regulation.
	Teacher-led introduction (5 min) • https://www.youtube.com/watch?v=xpAnLXc_bIU • Watching the film <i>Tools:</i> Smartboard, laptop, projector, video <i>Method:</i> Audiovisual method, followed by a heuristic discussion Individual work (5 min) Digital Activity – Mentimeter – Prompt: “What does an eco-school mean to you?” -Students respond via their phone or tablet -A “word cloud” is generated <i>Tools:</i> Tablets/phones, laptop, digital tools; <i>Method:</i> Interactive online survey (Mentimeter) Whole-class discussion (5 min) • Guided discussion: Analyzing the terms in Mentimeter—Which words appear most often? • Question: Why is it important to think about the environment right here in school? <i>Method:</i> Heuristic conversation, formative assessment

	https://www.youtube.com/watch?v=9jI27zb35_A Video Presentation (5 min) Explanation of the Green Loop concept and upcycling concept (5 min) Through discussion and examples, the difference between: linear consumption: use – throw away circular consumption: use – recycle – reuse <i>Tools:</i> Smartboard, laptop, projector, video <i>Method:</i> Audiovisual method, followed by a heuristic discussion <i>Expected outcome:</i> Understanding of the concept of upcycling
	Working in pairs (5 min) Students identify waste in the school <i>Tools:</i> Sticky notes <i>Method:</i> Cooperative learning Class discussions (10 min) The ideas gathered from the students are written on a poster, then grouped according to the material from which they are made <i>Tools:</i> Notebook, Posters, Markers <i>Method:</i> Heuristic conversation Quick break (5 min) Energizing exercise: “The Moving Mirror” – in pairs

	Teamwork (10 min) The students are divided into four groups, each with a specific theme: • Eco-friendly classroom • Eco-friendly recreation areas / schoolyard • Eco-friendly cafeteria • Eco-friendly activities for students -Evaluation and Reflection (15 min) The teacher guides the students by asking questions: What recycled products can be used? What objects can be made from recycled materials? What eco-friendly solutions do they suggest? <i>Tools:</i> Posters, markers <i>Method:</i> Structured collaborative learning Each group presents their ideas on a poster Students explain whether they encountered any difficulties in creating these posters <i>Tools:</i> Posters, markers; <i>Method:</i> Lecture, guided discussion, self-assessment
	Feedback (15 min) The “Gallery Walk” method is used: - The posters are displayed, - Students walk around, examine them, and leave comments or stickers. Assessment using the "Traffic Light" method 🚦 Colors: ● green – clear and feasible idea; ● yellow – good idea, but needs some tweaking ● red – unclear idea / difficult to implement

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	<i>Tools:</i> Posters, markers, colored sticky notes <i>Method:</i> Peer assessment <i>Expected outcome:</i> -understanding the relationship between resources, production, consumption, and waste -the ability to provide real-life examples -clarifying misconceptions Summary and evaluation (5 min) Kahoot—to assess understanding of the Green Loop concept\ The teacher emphasizes the key idea: “The Green Loop is not just a concept, but a way of life. The school starts with us.” <i>Tools:</i> Tablets/phones, laptop, digital tools <i>Method:</i> Interactive online quiz (Kahoot) <i>Expected outcome:</i> Correct identification of key concepts (e.g., linear vs. circular economy)
Assessment & Reflection	Formative: The teacher observes pair and group work; The teacher actively participates in the “Gallery Walk” and “Traffic Light” methods; The teacher evaluates students’ work, their level of engagement, and how they present their ideas Peer evaluation The feasibility of the ideas proposed by the students is discussed Reflection question: “Which idea could be put into practice as early as this month?” <i>Assignment:</i> Create a poster on the theme “My Eco-School”:

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Inclusion Strategies (UDL)	1. How can students demonstrate what they know? ✓ Group work: Allows students to choose the format of their final product: a hand-drawn poster, a list of ideas in text form, or even a short presentation video. This flexibility supports both creativity and students' individual strengths. ✓ Individual Reflection: Students can choose to write a short text, record an audio message, or draw an emoji ✓ Peer review: the "Gallery Walk" and "Traffic Light" peer assessment methods 2. How can we ensure that students grasp and understand the content? ◦ Introductory videos – Both visual and textual examples are used to help students understand the difference between linear and circular consumption ◦ Subtitles or a written version of any video are provided. ◦ The teacher provides instructions both verbally and in writing on the board or on the worksheet. ◦ <i>Tools:</i> YouTube with subtitles, printed visual materials 3. "How can we help students connect with and engage in the topic?" ▪ Ask students to bring examples of items from school life that could be recycled or reused, thereby increasing the lesson's relevance. ▪ Using Mentimeter and Kahoot! provides a safe space for shy students to respond anonymously, reducing communication barriers. ▪ During group work, the teacher intentionally visits groups that include students with special educational needs, offering simplified guiding questions (e.g., "What is this object made of?" instead of "Analyze the sustainability of the material")
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Real-World Connection / Impact	Who will see or use this project (the class, the school, parents, the community)? The class community: Students present their solutions for the “Eco School” (mini-plans displayed on posters) to their classmates, who provide constructive feedback on the feasibility of the ideas. School-wide visibility (expansion): The “My Eco-School” drawings or posters can be displayed in the school lobby or on the bulletin board as part of an awareness campaign titled “Let’s Transform Our School Together.” The selected ideas (e.g., pallet benches, cardboard collection bins and decorations, mini windmills, and balls made from recycled fabric) can be presented to the Student Council or school administration for actual implementation. Parents and guardians: Students can discuss with their parents the alternative energy or recycling solutions presented in the lesson and work together to create a “family recycling plan.” Making a useful item from recycled materials at home, involving family members in the creative process. The extended school or the local community: Photos of the final projects or the short eco-promotional videos can be posted on the school’s website or Facebook/Instagram page to inspire other schools. What kind of real change could this activity bring about in school or in everyday life? 1. More informed consumption habits: Students begin to distinguish between linear and circular consumption, putting this into practice through recycling during breaks. 2. Improving the school environment: Concrete proposals (e.g., cardboard decorations, sustainable recreational spaces) can help beautify the school at no cost, using resources that would otherwise have been thrown away.
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	3. Empowerment: Students realize that their voices matter and that they can propose solutions to global problems, starting at the local level 4. Cultural shift: The transition from “throwing away” to “transforming” becomes a way of life within the school (“Green Loop is not just a concept, but a way of life”).
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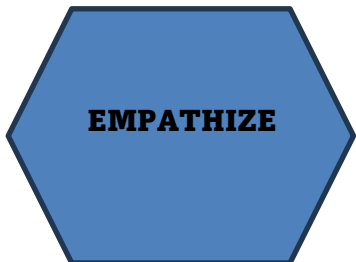
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GREEN LOOP LESSON PLAN

Lesson Title	The Second Life of Paper – From Recycling to Creation
Curriculum Link / Subject	Interdisciplinary: Biology, Chemistry, Art, Geography, Civics, Technology
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☒ Repair ☒ Recycle
Teacher	Bitá Nicoleta
Grade Level	Grades 7 - 8
Time/Duration	90 minutes
Objectives	Academic/subject/thinking skills objectives • Developing research, teamwork, communication, and entrepreneurial skills.
	Sustainability/Circular Objectives: • Understanding the principles of the circular economy and the term “upcycling.” • Promoting sustainability and environmental responsibility. • Discovering the environmental impact of paper production and identifying local sources of waste.
Systems Thinking Elements	• <i>What affects what?</i> Natural resources (wood/water) → Paper production → Consumption in schools/offices → Waste generation → Climate impact. • <i>Where do the losses occur?</i> Poor management of paper and cardboard waste in the local community.

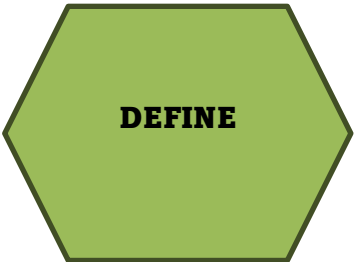
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	• <i>Where do the losses occur?</i> Poor management of paper and cardboard waste in the local community. • <i>A small effort with a big impact:</i> Turning waste into art for a charity fair.
	Teacher-led (5 min) Watching the video about global warming. https://www.youtube.com/watch?v=Vztjbm6HA58 A discussion on the importance of protecting the environment through responsible consumption. • Tools: YouTube video, projector/interactive whiteboard. • Method: Visual trigger + teacher framing. Individual (2 min) The teacher shows the following image, asks the students if they have seen it before, and what it means  An analysis of the recycling symbol and its impact on the planet. Pair work (3 min) After the discussion, the students fill in the table:

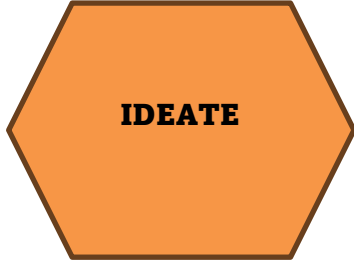
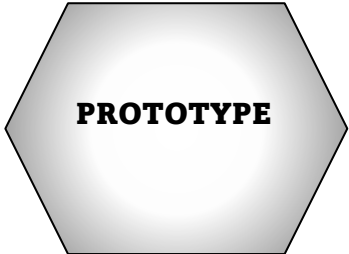
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	Reduce	Reuse	Recycle
	- It involves responsible and moderate consumption, choosing products with minimal packaging or avoiding the purchase of unnecessary items	- Reuse involves using items and packaging multiple times, replacing single-use items with more durable ones.	- Recycling involves transforming waste into new materials, thereby preventing it from being discarded and helping to conserve natural resources
	Teacher-led framing (5 min) - Students are divided into groups of four. The teacher asks them to research online what the term “upcycling” means and to find a definition or an image that explains it. They will submit their answers by contributing to the Padlet. https://padlet.com/nbita67/subiectul-de-discu-ie-apare-aici-v3i3619w4wro6psl Tools: Tablets, cell phones Method: Interactive Online Survey (Padlet) The students watch the movie (5 min): https://www.youtube.com/watch?v=9jI27zb35_A Tools: YouTube video, projector/interactive whiteboard. Method: Visual trigger + teacher framing. Pair work (3min) Students work in pairs and answer the question, “What is the most common type of waste produced at school?” The answers are written on sticky notes, which will be attached to an A3 poster. Tools: stickers, poster Method: Cooperative learning		

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 IDEATE	The students, divided into four groups, will work on one of the assignments; they will use laptops or phones and look up information online. (7 min) 1. How is paper made? What resources are used in the process? 2. What types of paper and cardboard waste are there? 3. Where do we find the most paper waste in the community? 4. What does paper recycling mean? What can be made from it? The students answer the question, and their answer is displayed on an A3 poster. Each group presents their answer to the question; the answer can be a sentence, a drawing, or a short video. (7 min) The students watch the following video (5 min). https://www.youtube.com/watch?v=_IrtjArqTAg ● Tools: YouTube video, projector/interactive whiteboard, A3 poster, school supplies. ● Method: Collaborative learning, lecture-style instruction , Visual trigger + teacher framing. Energizing exercise: “The Reverse Mirror” (3 min)
 PROTOTYPE	The students watch the following video. (5 min) https://www.youtube.com/shorts/chmWlb3XEic Students are divided into groups of four. They are provided with white and colored paper, cardboard, and various stationery items. They will research online, and each group will create decorations for the Christmas Fair. (30min)

	Tools: YouTube video, projector/interactive whiteboard, school supplies, recycled paper and cardboard Method: Visual trigger + teacher framing, teamwork, hands-on activities.
	Feedback (8 min) Each group displays the products they have created and presents the materials used and the production process. Classmates provide feedback on the products based on creativity and the reuse of materials. Summary and evaluation (2 min) Students answer 3 questions on an assessment sheet: 1. What materials did you use to make your object?(Circle or check all that apply) • Newsprint • Cardboard • Corrugated cardboard • Recycled colored paper • Others: _____ 2. Why do you think it's important to recycle paper and cardboard? Open-ended response: _____ 3. What did you learn from this activity? • How to Recycle Paper • That I can be creative even with old things • Recycling Information • How to Work in a Team • Something else: _____ Tools: School supplies, paper Method: Peer review, questionnaire

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Assessment & Reflection	• Formative: The teacher observes the students working in pairs and in groups . The teacher appreciates the students' work, their level of engagement, and the quality of their projects. • Peer evaluation The feasibility of the ideas proposed by the students is being discussed . • Topic: Designing a poster to promote the Christmas Fair.
Inclusion Strategies (UDL)	1 . Task allocation Not all students need to create the same complex object. Tasks of low difficulty: Students with fine motor skill difficulties can help tear paper by hand or paint large surfaces. Intermediate tasks: Cutting along outlines, assembling simple geometric shapes. Advanced tasks: Creating complex origami models or coordinating the final design of the object. 2. Cooperative learning Heterogeneous groups: Teams are formed in which students with special educational needs (SEN) work alongside peers who have well-developed practical skills. Complementary roles: Instead of working individually, students are assigned roles in the “recycling workshop” (e.g., one measures, one cuts, one glues, one decorates). This reduces the pressure of having to complete a project from start to finish on their own. 3. Adaptation of materials and the environment Visual aid: The steps are illustrated with clear icons or photos, not just verbal instructions. This helps students with auditory processing difficulties or those who lose focus easily.

	Customized tools: It provides spring-loaded scissors (that open on their own), thick-handled brushes, or pre-cut stencils to help ensure immediate success. 4. Strategies for Emotional Engagement Focus on the process, not just the product: the assessment values recycling efforts and collaboration. Contribution to the Christmas Fair: It is explained that every object, no matter how simple, is part of a shared cause. This sense of belonging to a noble cause (raising funds or helping the community) boosts self-esteem.
Real-World Connection / Impact	1. Environmental Awareness (Upcycling) This activity isn't just "craftwork"; it's a lesson in the circular economy. Impact: Students understand that resources are limited and that waste can be transformed into resources through creativity. Students make the transition from the abstract concept of environmental protection to the concrete action of upcycling. They observe how raw materials (paper that was about to be thrown away) gain new aesthetic and economic value, reducing the school community's carbon footprint. 2. Entrepreneurship and Financial Literacy The Christmas market is the perfect setting for a real-world business simulation. Impact: Students take on the roles of producer, promoter, and salesperson. The activity simulates a real-world economic environment, where students learn to estimate the value of their work, set fair prices, and present their products in a way that appeals to fairgoers. This helps develop communication and negotiation skills. 3. Social Responsibility and Civic Engagement If the proceeds from the fair are donated, the impact is primarily moral and empathetic. The Impact: Students see how their skills can contribute to the common good.

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	The project has a strong impact on the community, fostering a spirit of solidarity. The results of their work support a social cause (e.g., helping a family in need or a senior center), giving students a sense of belonging and the satisfaction of being agents of change in their community.
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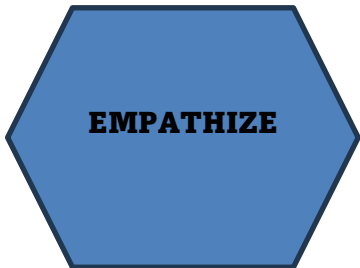
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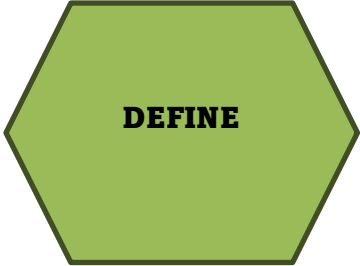
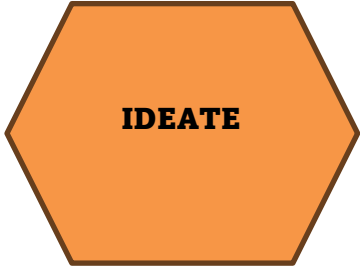
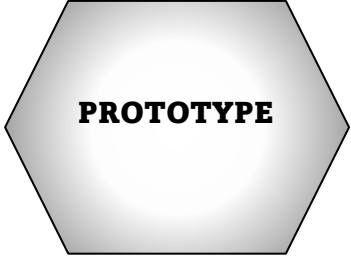
GREEN LOOP LESSON PLAN TEMPLATE

Lesson Title	Rescue & Reimagine, The Upcycling Showdown
Curriculum Link / Subject	Science, Civic Education, Technology, Environmental Education
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☒ Repair ☒ Recycle
Teacher	Goicovici Mironela Fabiola
Grade Level	7th
Time/Duration	90 minutes
Objectives	Academic/thinking skills objectives Students will - Analyze how waste is produced and managed - Understand the difference between linear and circular systems - Apply creative thinking to design sustainable solutions - Collaborate effectively in teams - Communicate ideas clearly through presentations
	Sustainability/Circular Objectives - Recognize waste as a potential resource - Understand upcycling as part of the circular economy - Design solutions that reduce environmental impact - Reflect on personal consumption habits

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Systems Thinking Elements	• What affects what? Consumption habits → waste generation Product design → environmental impact Human choices → sustainability outcomes • Where does waste or impact leak? Single-use materials Throw-away culture Lack of reuse systems • Practically, what can we do to produce less waste and to create something useful? Reusing materials Creative redesign (upcycling) Conscious consumption
	• <i>Teacher Role:</i> Introduces the topic through a quiz and discussion Activates prior knowledge Creates emotional engagement • <i>Student Role:</i> Reflect on waste and consumption Respond to quiz Share ideas • <i>Tools/Materials:</i> Mentimeter • <i>Expected Output:</i> Awareness of environmental issues Initial understanding of circular thinking

	• <i>Teacher Role:</i> Clarifies concepts (recycle vs upcycle) Focuses students on the problem • <i>Student Role:</i> Students synthesise findings and agree on one key challenge. • <i>Tools/Materials:</i> Whiteboard, Google Docs, sticky notes. • <i>Expected Output:</i> Clear understanding of the challenge
	• <i>Teacher Role:</i> Encourages multiple ideas Supports creative thinking • <i>Student Role:</i> Generate and select ideas • <i>Tools/Materials:</i> notes, Canva, etc • <i>Expected Output:</i> One selected idea per group
	• <i>Teacher Role:</i> Facilitate, provides formative feedback and ensures participation • <i>Student Role:</i> Students create models,/posters • <i>Tools/Materials:</i> things usually considered garbage • <i>Expected Output:</i> Functional or creative prototype

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 TEST & ITERATE	• <i>Teacher Role:</i> Teacher organises peer feedback sessions and encourages revisions. • <i>Student Role:</i> Students present their solution, receive feedback, and refine their design. • <i>Tools/Materials:</i> Peer feedback forms, Google Forms, Flip, Padlet. • <i>Expected Output:</i> Improved prototype with documented changes
Assessment & Reflection	Formative • questioning • observation • teacher feedback during work Peer Assessment • feedback during presentations Summative • final product • presentation quality

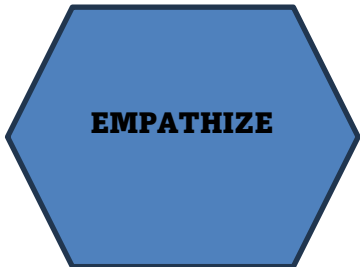
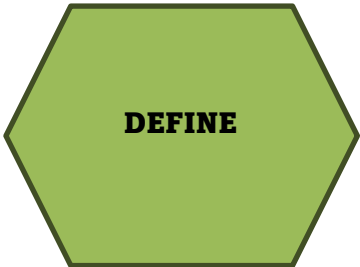
Inclusion Strategies (UDL)	SEN/ELL learners will be the ones challenged to start the teams, if pressure allows it for them. Usually, they are the last to be chosen, but this way, they will understand they are valued, having the chance to choose first, just like in making a football team. These students will benefit from visual helpers, translation where needed and peer support. They will be encouraged to assume various roles: planner, builder, presenter, etc, according to the role that suits them. • Multiple entry points (quiz, making, presenting) • Group collaboration • Visual and verbal support • Choice of ideas • Structured prompts
Real-World Connection / Impact	Students will think twice before discarding waste. They will • design real solutions • understand consumption • connect learning to daily life Having a fun memory of upcycling will make them wish to repeat the experience.

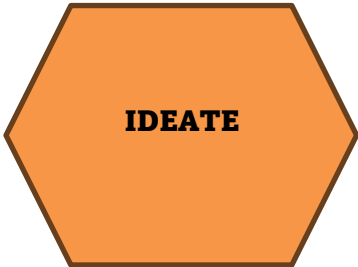
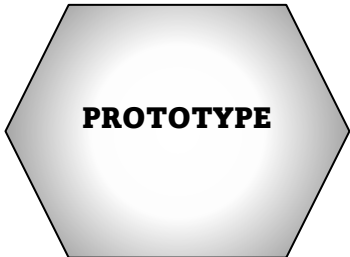
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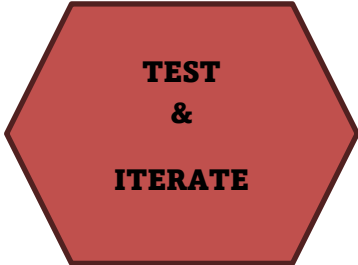
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GREEN LOOP LESSON PLAN

Lesson Title	Upcycling Clothes
Curriculum Link / Subject	Environmental education, Engineering, Mathematics, Ethics, Social skills, art
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☒ Repair ☒ Recycle
Teacher	Mgr. Lenka Vatrálová Mgr. Veronika Vačková Hrnková PaedDr. Jana Meňhartová
Grade Level	7 th
Time/Duration	90 min
Objectives	Academic / Thinking Skills Objectives • Understand the benefits of repairing and reusing clothes. • Discuss the impact of shopping habits in the modern world. • Identify personal solutions or ideas. • Prevent consumerism within the environment and society. • Inspire and motivate learners to be trendy and show renewed clothing items in a fun and practical way. Sustainability/ Circular Objectives • Understand principles of the circular economy. • Develop teamwork, creativity and presentation skills. • Connect knowledge from STEAM fields.
Systems Thinking Elements	• What can prevent waste generation in the city?

	• Why is it important to repair and reuse clothes? • How and where can they be used (social occasions)? • What can we do to raise awareness among a consumer?
	• <i>Teacher Role:</i> <i>Facilitates discussion about the importance of reusing clothes and protecting the environment; shows a short video or presentation about child labour and examples of countries where it occurs.</i> • <i>Student Role:</i> <i>Students share ideas, discuss how to reduce or eliminate the problem, cooperate in groups</i> • <i>Tools/Materials:</i> <i>slido.com, video, photos</i>
	• <i>Teacher Role:</i> <i>Guides students using Internet and AI tools (Copilot) to answer key questions: What problem are you solving? What do you need to learn? What are the constraints? How will you measure success?</i> • <i>Student Role:</i> <i>Students search for answers online and formulate their understanding.</i> • <i>Tools/Materials:</i> <i>Tablets, an internet</i> • <i>Expected Output:</i> <i>Clear problem statement.</i>

 IDEATE	• <i>Teacher Role:</i> <i>Encourages brainstorming and divergent thinking without judgment.</i> • <i>Student Role:</i> <i>Generate multiple creative ideas; choose top 1–2 concepts.</i> • <i>Tools/Materials:</i> <i>Tablets, Paper, Coloured pencils</i> • <i>Expected Output:</i> <i>Sketches or drafts of proposed clothing designs.</i>
 PROTOTYPE	• <i>Teacher Role:</i> Encourages students to think about construction methods and evaluate ideas through brainstorming. • <i>Student Role:</i> Teams explore creative ways to reuse clothes and test construction ideas. • <i>Tools/Materials:</i> <i>Old clothes, Needle, Thread, Decorative buttons</i> • <i>Expected Output:</i> <i>Prototype of redesigned/upcycled clothing.</i>

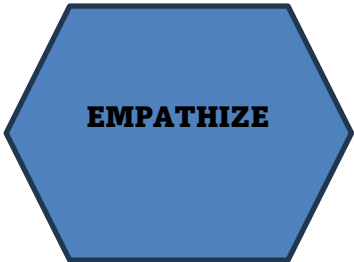
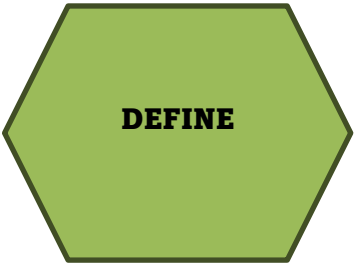
	• <i>Teacher Role:</i> Organises peer review, encourages revisions, evaluates according to criteria: functionality, practicality, teamwork. • <i>Student Role:</i> Present models, receive feedback, refine design. • <i>Tools/Materials:</i> Peer feedback forms • <i>Expected Output:</i> Improved clothing models with documented changes (sketch/drawing notes).
Assessment & Reflection	• Teacher rubric • Digital documentation (photos, videos, final models) • Peer feedback — voting for most interesting & most creative model • Student self-reflection — fashion show
Inclusion Strategies (UDL)	• How will SEN/ELL learners be supported? Support for SEN/ELL learners • Group work improves social and communication skills; small groups support quieter students.

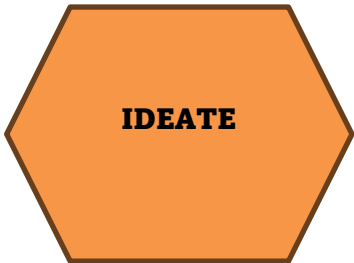
	- Each learner can contribute by drawing, suggesting ideas, sewing, researching, or documenting. Adaptations Visual Supports: - Step-by-step illustrated guides, inspirational photos, visual vocabulary cards. Scaffolds: - Graphic organisers for brainstorming/sketching. - Checklists for design-thinking phases. - Peer feedback templates. Group Roles: - Sketches ideas - Searches for information - Works on sewing/construction - Documents process (photos/videos) - Presents final product
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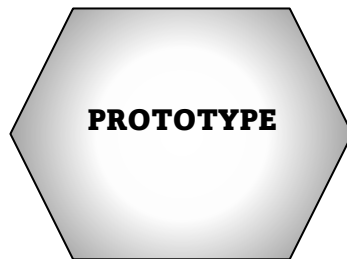
	Language Supports: • Bilingual word bank • Translation tools • Multimodal communication (drawings, gestures)
Real-World Connection / Impact	Who will see the work? • Classmates: fashion show, feedback sessions • School community: hallway exhibition, school swap event • Parents: digital platform or parent meeting • Local community: school website/social media, community swap event Possible real-world impact • Reduces textile waste by promoting repair & reuse • Encourages creativity and innovation • Shapes mindful shopping habits • Builds culture of sharing & collaboration • Raises sustainability awareness among the school community

GREEN LOOP LESSON PLAN

Lesson Title	Reduction of single-use dishware
Curriculum Link / Subject	• Science • Technology • Computer Science / STEAM • Environmental Education • Ethics Education (consumer behaviour)
Circular Economy Theme	☐ Refuse ☒ Reduce ☒ Reuse ☒ Repair ☒ Recycle
Teacher	Mgr. Lenka Vatrálová
Grade Level	6 th – 8 th grade
Time/Duration	90 – 120 min
Objectives	Students will be able to: • explain the environmental impacts of single-use dishware, • identify which stages of the life cycle cause the greatest problems, • create a solution proposal using STEAM (model, prototype, mock-up), • apply principles of the circular economy (refuse, reduce, reuse), • work in PBL teams, ideate and test solutions, • prepare recommendations for the school or community.
Systems Thinking Elements	• analyzing the connections between consumption, waste, and environmental impacts, • identifying points where we can intervene in the system (leverage points), • understanding that “waste” begins already at the product design stage, not only at the bin.

 EMPATHIZE	• Teacher Role: Shows students pictures or real objects of single-use dishware (plastic items, paper cups, cutlery). <i>Poses the challenge: "Why does our society still rely on single-use dishware?"</i> <i>Plays a short video about the impacts of single-use plastics (optional).</i> • Student Role: Describe their own experiences (school, festivals, home). <i>Identify problems such as waste, recycling challenges, environmental pollution, and resource consumption.</i> • Tools/Materials: Samples of dishware, photographs, worksheet with basic questions.
 DEFINE	• Teacher Role: Teacher divides the class into teams of 3–4 students and explains the PBL assignment: "Your task is to find out how to reduce the use of single-use dishware in the school or community and to create a proposal for a solution." • Student Role: Each team will: ○ explore where single-use dishware is used in the school, ○ identify the causes (laziness, convenience, lack of alternatives, cost), ○ formulate their own "How Might We...?" problem statement, e.g.: <i>"How might we reduce the use of single-use cups in the school cafeteria?"</i>

	- Tools/Materials: Post-it notes, A3 paper - Expected Output: A clearly defined problem and its underlying causes.
	<i>Teacher Role:</i> Uses creative techniques: 6–3–5 method, mind maps, sketching, Guides students to consider elements of the circular economy. <i>Student Role:</i> They generate a variety of ideas, for example: - introducing reusable/returnable cups at school, - designing a reusable cup for school events, - creating a dish-library (borrow-a-cup/plate system) for classes or events, - cup-swap system among students, - a station for hygienic washing of personal cups, - reducing packaging for snacks in the school buffet, - a reward system for using personal reusable dishware. <i>Tools/Materials:</i> Paper, markers <i>Expected Output:</i> A list of ideas and selection of the one best solution.



- *Teacher Role:*
Provides materials for 3D modelling.
Observes the process and asks guiding/supportive questions.

- *Student Role:*
Teams create a functional or visual prototype, for example:
 - *a model of a returnable cup system (e.g., a cardboard mock-up of a dispensing machine),*
 - *a 3D model of a multifunctional cup made from cardboard, fabric, or modelling clay,*
 - *a model of a washing station for reusable dishware,*
 - *a poster or visual campaign design representing the winning idea,*
 - *a digital prototype, such as a QR-based tracking system for reusable cups.*

- STEAM connections:*
 - *technology – construction of the model,*
 - *art – design and visualisation,*
 - *computer science – optional digital solution,*
 - *science – environmental impacts,*
 - *mathematics – calculations of waste reduction.*

- *Tools/Materials:*
Adhesive tape, cardboard, paper, markers, waste materials, string, modelling clay, LEGO.

- *Expected Output:*
A complete prototype of the proposed solution.

	• <i>Teacher Role:</i> They test each other's prototypes. They add 2–3 improvements based on the feedback received. • <i>Student Role:</i> Test each other's prototypes. Add 2–3 improvements based on the feedback received. • <i>Tools/Materials:</i> <i>Evaluation cards, markers</i> • <i>Expected Output:</i> <i>An improved prototype plus a short description of the changes</i>
Assessment & Reflection	What did you learn about single-use dishware? Which solution reduces waste the most? How could your proposal be implemented at school?.
Inclusion Strategies (UDL)	• How will SEN/ELL learners be supported? ○ option to work with visual icons, ○ voice-based instructions for students with reading difficulties, ○ multiple levels of prototype complexity, ○ students can choose a role (designer, technician, researcher, facilitator).

Real-World Connection / Impact	○ students address a real problem that affects their school, ○ they are able to implement their solution in real life, ○ they learn consumer responsibility, ○ they become aware of the value of the circular economy in everyday life.
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ASSESSMENT RUBRIC

Topic: Reduction of single-use dishware

Method: *PBL + STEAM + Circular Economy*

Duration: 90 - 120 minutes

Maximum score: 20 points

	4 points	3 points	2 points	1 point	0 point
EMPATHIZE - Understanding the Problem	The student/team clearly explains why single-use dishware is a problem, identifies its environmental impacts, and can describe the needs of users (school, community).	Understands most aspects of the problem and can provide several examples of impacts.	Shows a basic understanding of the problem, but arguments are limited or incomplete.	Understands the problem only partially (e.g., focuses only on the amount of waste).	Is unable to describe the problem or its connections.
DEFINE - Problem Definition	The team formulates a clear and well-defined “How Might We...?” problem statement, identifies the causes of the problem, and	The problem is defined, but without deeper analysis of its underlying causes.	The problem statement is incomplete or too broad.	A minimal problem definition that cannot effectively guide the creation of a solution.	No problem statement is provided.

	defines the target context/environment.				
IDEATE – Idea Generation	The team generates multiple original ideas, considers circular economy principles (reduce, reuse, repair), and selects a well-reasoned solution.	Several functional ideas are proposed, but the level of creativity is lower.	A limited number of ideas; the concepts are general or lack depth.	Only one simple idea is produced, with no clear connection to the defined problem.	No ideas are generated.
PROTOTYPE – Prototype Creation	The prototype is aesthetic, functional, clearly demonstrates the solution, and explains how it reduces the use of single-use dishware. Creatively incorporates STEAM elements.	The prototype is solid and includes most key elements, though some details are less fully developed.	The prototype is incomplete or unclear; critical elements are missing.	The prototype is very simple and difficult to interpret.	No prototype was completed.

TEST & ITERATE – Testing and Improvements	The team presented the prototype, obtained feedback, implemented specific and meaningful improvements, and was able to explain why the changes are effective.	The prototype was tested and partially improved.	Improvements are minimal or superficial.	Only cosmetic changes were made; reflection is missing.	No testing or no improvements were completed.
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Bonus Category (optional): Presentation (0–2 points)

(Does not count toward the required maximum of 20 points — can be added as a motivational category.)

2 points: A clear, convincing presentation in which all team members participated.

1 point: A basic presentation.

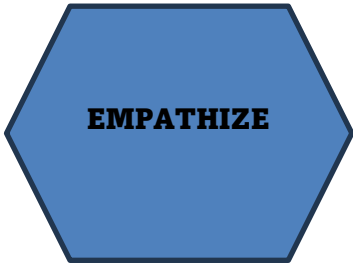
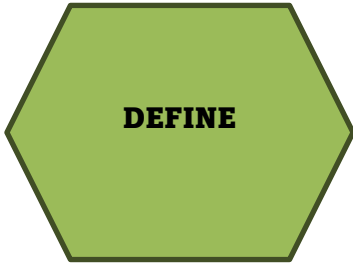
0 points: No presentation.

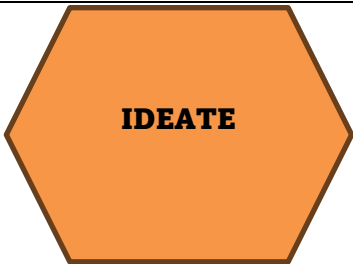
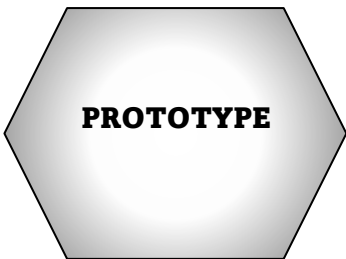
GREEN LOOP LESSON PLAN

Lesson Title	Circular City
Curriculum Link / Subject	Environmental education, engineering, maths, ethics, social skills, art
Circular Economy Theme	☒ Refuse ☒ Reduce ☐ Reuse ☐ Repair ☒ Recycle
Teacher	Mgr. Lenka Vatrálová, Mgr. Beáta Konvičková
Grade Level	8 th graders
Time/Duration	90 minutes
Objectives	Academic/subject /thinking skills objectives • Understand the benefits of reusing various materials that would otherwise become waste • Define students own solutions and ideas • Prevent a consumerist lifestyle in the context of environment and society • Inspire and motivate residents to create recycling centers in the city, for example green roofs, walls or community gardens etc. • Present a model of city, based on circular economic principles
	Sustainability/Circular Objectives 1 Understand the principles of the circular economy in an urban environment 2 Develop teamwork, creativity and presentation skills 3 Connect knowledge from various STEM fields

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Systems Thinking Elements	• What can prevent waste generation in the city? • How can emissions be reduced in the city? • What can we do to aware consumers? • How this impacts education and health in our society?
	• Teacher Role: Teacher facilitates discussion about importance of waste recycling and environmental protection, shows a short video or presentation about a circular city and an example of places where it has been implemented • Student Role: Students share their ideas and discuss. They cooperate together as they work in groups. • Tools/Materials: menti.com , pictures, presentation, video
	• Teacher Role: Teacher guides students to find answers to questions by using Internet, AI (ChatGPT, Copilot): What is the problem you are trying to solve? What do you need to know or learn to solve the problem? What are the constraints and criteria? How will you know if you have successfully completed this problem? • Student Role: Students use the Internet to find answers. • Tools/Materials: Tablets or phones, Internet • Expected Output: Identifying the problem

 IDEATE	• <i>Teacher Role: Teacher defines limitations and presents principles of circularity.</i> • <i>Student Role: Students will design city zones with principles of circularity. They create a sketch or a map.</i> • <i>Tools/Materials: paper, crayons</i> • <i>Expected Output: Sketch or a map of the city</i>
 PROTOTYPE	• Teacher Role: Teacher brainstorms their ideas, encourages them to think about the best construction. • Student Role: Students make a decision based on the pros and cons of their model. • Tools/Materials: Worksheet. • Expected Output: Prototype of the model.
 TEST & ITERATE	• <i>Teacher Role: Teacher evaluates each model according to criteria: functionality, practical use, teamwork</i> • <i>Student Role: Students check the functionality of their model, improve it and test it again.</i> • <i>Tools/Materials: worksheet, paper,</i> • <i>Expected Output: Improved model of the circular city.</i>
Assessment & Reflection	• Teacher rubric , digital documentation-photos, videos, presentation • Peer feedback (voting for the most innovative city) • Student self-reflection

Inclusion Strategies (UDL)

- How will SEN/ELL learners be supported?
Students will work together in groups, so they improve their social and speaking skills. Small group work allows quieter students to participate comfortably.
Each student contributes in their own way – drawing, suggesting ideas, writing descriptions.

- What adaptations (visuals, scaffolds, group roles, language supports) will be offered?

Visuals

Introductory video: A short documentary about circular cities (e.g., Copenhagen example).

Sketches and maps: Students create visual representations of their circular city.

Model presentation: Physical or digital models displayed during group presentations.

Scaffolds

Step-by-step progression: Clear stages (Identify → Search → Develop → Select → Model → Test → Improve → Communicate).

Guiding questions: What problem are you solving? What materials will you use? How will you know your solution works?

Teacher-defined limitations: Practical use, positive environmental impact, cost-saving, teamwork.

Evaluation criteria: Practicality, functionality, teamwork.

Brainstorming templates: For pros/cons and decision-making.

Group Roles

Role distribution for inclusivity:

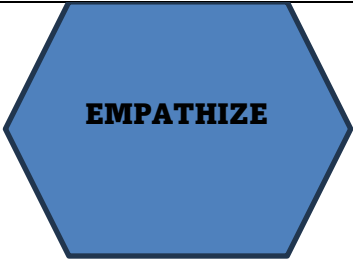
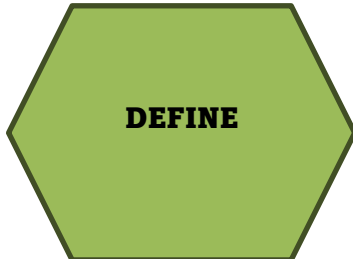
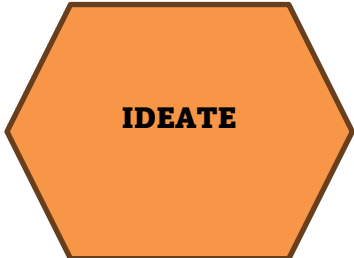
Person 1: Choose city area for implementation. Person 2: Decide on materials. Person 3: Design the model. Person 4: Present results.

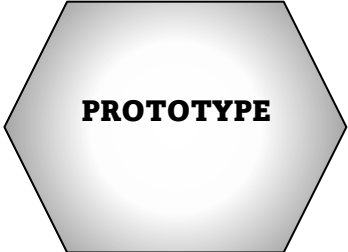
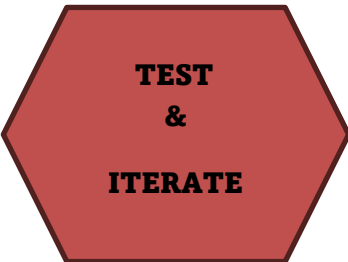
	Additional roles for engagement: Builders, Decorators, Presenters, Documenters (photos/videos). Tech support during presentations. Language Supports Vocabulary lists: Key terms like “circular economy,” “reuse,” “composting,” “rainwater harvesting.” Sentence starters for presentations: “Our city reduces waste by...”, “Energy is saved through...” Visual glossaries: Diagrams or maps with labels for city zones and circularity principles. Peer support: Mixed-ability grouping for collaborative learning. Digital tools: Use AI (Copilot, ChatGPT) for research and language assistance.
Real-World Connection / Impact	- Who will see or use this work (class, school, parents, community)? The lesson plan indicates that the work will be shared beyond just the classroom: Class: Students will present their models to classmates during the final stage. School: There is an option for an exhibition of models at school and voting for the most innovative city. Parents and community: The plan mentions digital documentation (photos, videos, presentations) and involving the whole school community, including younger students, parents, and teachers. - What real change could this activity create in school or daily life? In School Waste reduction initiatives: Students may start recycling more actively or propose creating recycling stations, compost bins, or repair corners in the school. Green spaces: Ideas like green roofs, vertical gardens, or community gardens could inspire school projects.

	Energy-saving habits: Turning off lights, reducing water waste, and promoting shared resources (e.g., book exchange, reusable materials). Awareness campaigns: Students could organize exhibitions or presentations for other classes, influencing the whole school community. In Daily Life Behavioral change: Students become more conscious about reusing items, repairing instead of discarding, and avoiding single-use products. Family involvement: Parents may adopt practices like home composting, rainwater collection, or waste sorting after seeing students' projects. Community engagement: Students could advocate for bike-sharing programs, local repair cafés, or zero-waste shops in their town.
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GREEN LOOP LESSON PLAN

Lesson Title	Second life
Curriculum Link / Subject	Art, Social studies, Environmental studies, Language Art
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☐ Repair ☐ Recycle
Teacher	Mgr. Veronika Vačková Hrnková, Mgr. Dominika Ružová
Grade Level	7 th -8 th graders
Time/Duration	90 minutes
Objectives	Academic/subject /thinking skills objectives 1. The benefits of reusing various materials that would otherwise become waste 2. Collaborate effectively in a group to plan and produce a product. 3. To promote recycling and the reuse of materials
	Sustainability/Circular Objectives 1. Prevent a consumerist lifestyle in relation to the environment and society 2. To inspire and motivate people to reduce waste and conserve natural resources 3. Define the concept of a circular economy and explain how it differs from a linear economy.

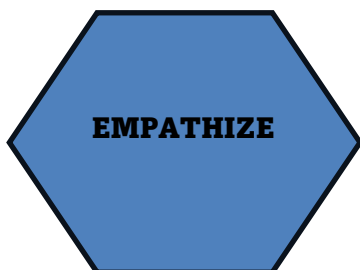
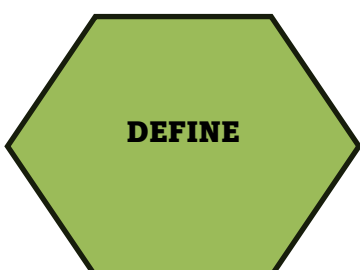
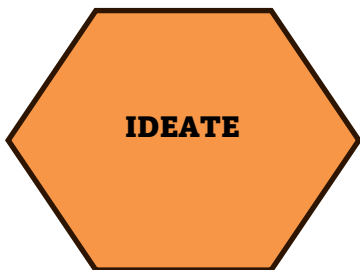
Systems Thinking Elements	Reuse waste, waste minimisation, prevent a consumerist lifestyle
 EMPATHIZE	• <i>Teacher Role:</i> Teacher facilitates brainstorming, discussions and explores user needs and problems. • <i>Student Role:</i> Students brainstorm, share their ideas, look up for examples and discuss real experiences. • <i>Tools/Materials:</i> Whiteboard, markers, pictures, worksheet
 DEFINE	• <i>Teacher Role:</i> Teacher presents an introduction to circular and linear economy, emphasizes principles of sustainability. • <i>Student Role:</i> Students listen to a presentation on circular economy, look at examples, start a discussion and share their ideas. • <i>Tools/Materials:</i> Projector, computer, worksheet. • <i>Expected Output:</i> Differences between linear and circular economy.
 IDEATE	• <i>Teacher Role:</i> Teacher encourages brainstorming and presents some motivational design or products that students can make from waste materials. • <i>Student Role:</i> Discussion about benefits of reusing various materials that would otherwise become waste. • <i>Tools/Materials:</i> Worksheet, paper waste, egg carton, cans, buttons, plastic bottles, glue, cardboard, toilet paper roll, crayon markers, scissors, hot glue gun, T-shirt.

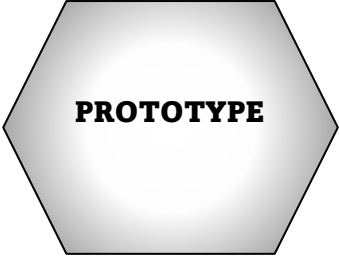
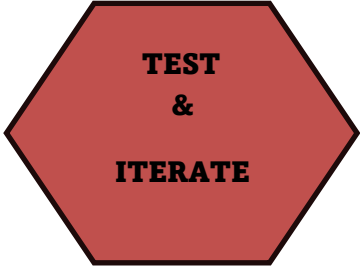
	<i>Expected Output: Practical use of products and functionality of model.</i>
 PROTOTYPE	<i>Teacher Role:</i> Teacher supports students in creating draft solutions in simple, tangible forms. <i>Student Role:</i> Students design their products from waste material, choose adjustment. <i>Tools/Materials:</i> Worksheet, paper waste, egg carton, cans, buttons, plastic bottles, glue, cardboard, toilet paper roll, crayon markers, scissors, hot glue gun, T-shirt. <i>Expected Output:</i> Practical use of products and functionality of model from waste.
 TEST & ITERATE	<i>Teacher Role:</i> Teacher encourages students to create their best solution, test and evaluate prototype, keep making changes if it is necessary. <i>Student Role:</i> Students will check the functionality of their model. Repeat testing or improve the prototype if it is necessary. <i>Tools/Materials:</i> Worksheet <i>Expected Output:</i> Improved products/prototype
Assessment & Reflection	- Teacher rubric or checklist - Peer feedback (deciding on the fragrance, texture and label) - Student self-reflection and presentation about their prototype (worksheet, emojis)
Inclusion Strategies (UDL)	How will SEN/ELL learners be supported? Small personal actions contribute to a bigger societal change. Sharing ideas deepen understanding. SEN students are part of a group, and they participate equally. The group can

	create a story about waste: where it was made, who used it, what happened to it. The story can be drawn as a commix or acted out as a short play • Visuals will be offered for SEN and the other learners as a part of a presentation and method of making the product. • Suitable for children with communication difficulties – they can draw or use gestures to express the story
Real-World Connection / Impact	• Who will see or use this work (class, school, parents, community)? Products which will be made could be used by students, but they can make more and share it with community or other students. • What real change could this activity create in school or daily life? Using waste to create functional products can contribute to a broader environmental change.

GREEN LOOP LESSON PLAN

Lesson Title	Natural Deodorant
Curriculum Link / Subject	Art, Social studies, Environmental studies, Language Art
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☐ Repair ☐ Recycle
Teacher	Mgr. Beáta Konvičková, Mgr. Dominika Ružová
Grade Level	7 th -8 th graders
Time/Duration	90 minutes
Objectives	Academic/subject /thinking skills objectives 1. Apply problem-solving skills to adjust recipes and packaging choices. 2. Collaborate effectively in a group to plan and produce a product. 3. Use scientific measurement skills to create a natural deodorant
	Sustainability/Circular Objectives 1. Evaluate their product in terms of effectiveness, safety and sustainability 2. Design a sustainable packaging solution using reused or recycled materials. 3. Define the concept of a circular economy and explain how it differs from a linear economy.
Systems Thinking Elements	• What problems might conventional beauty products cause?

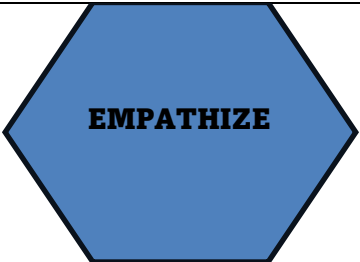
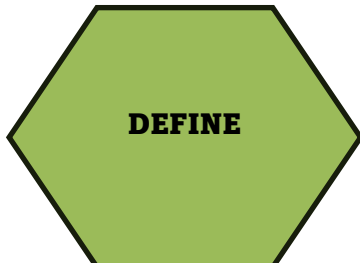
	What small sustainable change can you make in your life ?
	<i>Teacher Role:</i> Teacher facilitates brainstorming, discussions and explores user needs and problems. <i>Student Role:</i> Students brainstorm, share their ideas, look up for examples and discuss real experiences. <i>Tools/Materials:</i> Whiteboard, markers, pictures.
	<i>Teacher Role:</i> Teacher presents an introduction to circular economy, emphasizes principles of sustainability. <i>Student Role:</i> Students listen to a presentation on circular economy, look at examples, start a discussion and share their ideas. <i>Tools/Materials:</i> Projector, computer, worksheet. <i>Expected Output:</i> Differences between linear and circular economy.
	<i>Teacher Role:</i> Teacher encourages brainstorming and presents ingredients necessary to make a natural deodorant. <i>Student Role:</i> Discussion about how natural ingredients can serve as safer, more sustainable alternatives to synthetic deodorant components. <i>Tools/Materials:</i> Ingredients list, worksheet. <i>Expected Output:</i> List of ingredients and their functions.

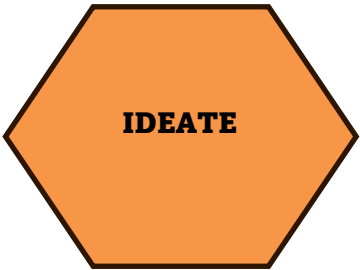
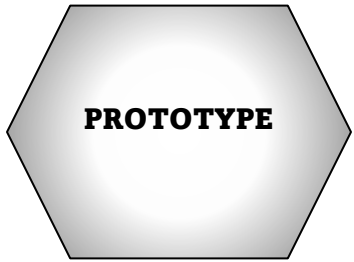
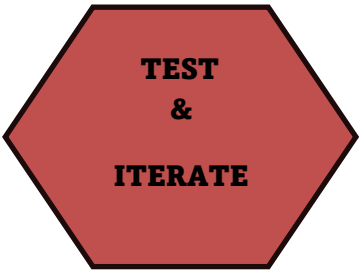
 PROTOTYPE	• <i>Teacher Role:</i> Teacher supports students in creating draft solutions in simple, tangible forms. • <i>Student Role:</i> Students design their deodorant recipe, choose adjustment. • <i>Tools/Materials:</i> Coconut oil, baking soda, cornstarch, essential oil, gloves, bowls, spoons, metal containers. • <i>Expected Output:</i> Mixture of ingredients.
 TEST & ITERATE	• <i>Teacher Role:</i> Teacher encourages student to adjust their mixtures if the texture is not smooth and solid. Teacher asks students to think about a label of their product. • <i>Student Role:</i> Students adjust their mixtures, fill in their deodorants into a container. They come to an agreement about their label (slogan, name). • <i>Tools/Materials:</i> Worksheet, metal containers. • <i>Expected Output:</i> Improved deodorant.
Assessment & Reflection	• Teacher rubric or checklist • Peer feedback (deciding on the fragrance, texture and label) • Student self-reflection (worksheet, emojis)
Inclusion Strategies (UDL)	• How will SEN/ELL learners be supported? Small personal actions (like switching deodorants) contribute to a bigger societal change. Sharing ideas deepen understanding. SEN students are part of a group, and they participate equally.

	Visuals will be offered for SEN and the other learners as a part of a presentation and method of making the product. They will be given a recipe with icons.
Real-World Connection / Impact	- Who will see or use this work (class, school, parents, community)? Product which will be made could be used by students, but they can make more deodorants and share it with community or other students. - What real change could this activity create in school or daily life? Using eco-designed products can contribute to a broader environmental change.

GREEN LOOP LESSON PLAN

Lesson Title	Handmade Bath bombs
Curriculum Link / Subject	Art, Science, Environmental studies, Math
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☐ Repair ☐ Recycle
Teacher	Mgr. Beáta Konvičková, Mgr. Dominika Ružová
Grade Level	7 th -8 th graders
Time/Duration	90 minutes
Objectives	Academic/subject /thinking skills objectives 1. Apply problem-solving skills to adjust recipes and packaging choices. 2. Collaborate effectively in a group to plan and produce a product. 3. Use scientific measurement skills to create a bath bomb. 4. Explain the basic acid–base reaction that makes a bath bomb fizz
	Sustainability/Circular Objectives 1. Evaluate the product in terms of effectiveness, safety and sustainability 2. Reflect on ingredient choices (natural vs synthetic) and potential environmental impacts. 3. Define the concept of a circular economy and explain how it differs from a linear economy.

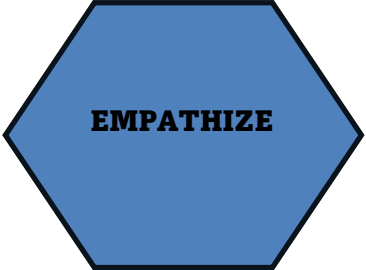
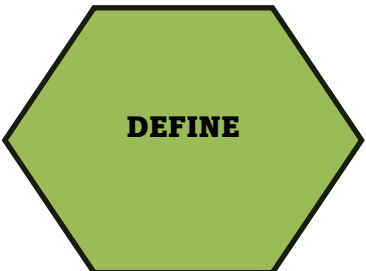
	4. Identify at least three ways to reduce waste when making/presenting products (reuse molds/packaging; upcycle materials; choose compostable ingredients).
Systems Thinking Elements	• What problems might conventional beauty products cause? • What small sustainable change can you make in your life?
	• <i>Teacher Role:</i> Teacher facilitates brainstorming, discussions and explores user needs and problems. • <i>Student Role:</i> Students brainstorm, share their ideas, look up for examples and discuss real experiences. • <i>Tools/Materials:</i> Whiteboard, markers, pictures.
	• <i>Teacher Role:</i> Teacher presents an introduction to circular economy, emphasizes principles of sustainability. • <i>Student Role:</i> Students listen to a presentation on circular economy, look at examples, start a discussion and share their ideas. • <i>Tools/Materials:</i> Projector, computer, worksheet. • <i>Expected Output:</i> Differences between linear and circular economy.

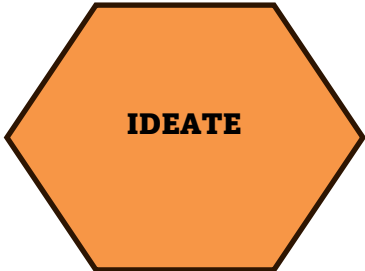
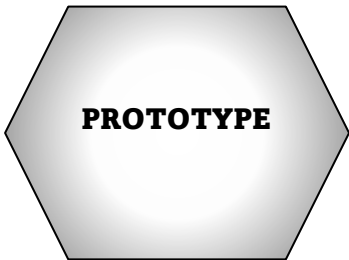
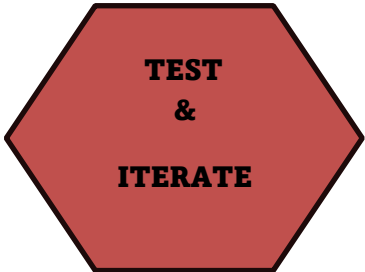
 IDEATE	• <i>Teacher Role:</i> Teacher encourages brainstorming and presents ingredients necessary to make a bath bomb. • <i>Student Role:</i> Discussion about how natural ingredients can serve as safer, more sustainable alternatives to synthetic components of conventional beauty products. • <i>Tools/Materials:</i> Ingredients list, worksheet. • <i>Expected Output:</i> List of ingredients and their functions.
 PROTOTYPE	• <i>Teacher Role:</i> Teacher supports students in creating draft solutions in simple, tangible forms. • <i>Student Role:</i> Students design their bath bomb recipe, choose a fragrance. • <i>Tools/Materials:</i> Coconut oil, baking soda, cornstarch, essential oil, , Epsom salt, citric acid,water, gloves, bowls, spoons, cotton cloth,yarn • <i>Expected Output:</i> Mixture of ingredients.
 TEST & ITERATE	• <i>Teacher Role:</i> Teacher encourages student to mix the ingredients gradually, and add water drop by drop. Teacher asks students to think about a label of their product. • <i>Student Role:</i> Students do their mixtures, fill in their bath bombs into the silicone mold. They come to an agreement about their label (slogan, name). • <i>Tools/Materials:</i> Worksheet, silicone molds. • <i>Expected Output:</i> Handmade bath bomb.
Assessment & Reflection	• Teacher checks if students follow the steps and if the bath bombs hold the shape.

	• Peer feedback (deciding on the fragrance, texture and label) • Student self-reflection (worksheet, emojis)
Inclusion Strategies (UDL)	• How will SEN/ELL learners be supported? • Sharing ideas deepen understanding. SEN students are part of a group, and they participate equally. • Visuals will be offered for SEN and the other learners as a part of a presentation and method of making the product. They will be given a recipe with icons.
Real-World Connection / Impact	• Who will see or use this work (class, school, parents, community)? Product which will be made could be used by students, but they can make more bath bombs and share it with community or other students. • What real change could this activity create in school or daily life? Using eco-designed products can contribute to a broader environmental change.

GREEN LOOP LESSON PLAN

Lesson Title	Why should we repair things rather than throw them away?
Curriculum Link / Subject	Art, Science, Environmental studies
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☐ Repair ☐ Recycle
Teacher	Mgr. Martina Lenická
Grade Level	7 th -8 th graders
Time/Duration	90 minutes
Objectives	Academic/subject /thinking skills objectives 1. Apply skills in practice. 2. Learn how to recycle various items. 3. Understand key concepts: reuse, sustainability. 4. Be able to cooperate effectively in a group.
	Sustainability/Circular Objectives 1. Be able to define what the circular economy is. 2. Select several items that may be damaged or worn out and find ways to reuse them. 3. Identify the benefits of repair (environmental, economic). 4. Recognize items that can be repaired. 5. Propose simple solutions for repair or reuse.

Systems Thinking Elements	• What impact can a linear economy have compared to a circular economy? • How can we make use of worn-out or non-functioning products (electronic devices such as a tablet, headphones, a mobile phone, a projector, etc.)?
	• <i>Teacher Role:</i> Teacher facilitates brainstorming, discussions and explores user needs and problems. • <i>Student Role:</i> Students brainstorm, share their ideas, look up for examples and discuss real experiences. • <i>Tools/Materials:</i> Whiteboard, markers, pictures, počítač
	• <i>Teacher Role:</i> Teacher presents an introduction to circular economy, emphasizes principles of sustainability. • <i>Student Role:</i> Students listen to a presentation on circular economy, look at examples, start a discussion and share their ideas. • <i>Tools/Materials:</i> Projector, computer. Whiteboard, markers • <i>Expected Output:</i> Differences between linear and circular economy.

 IDEATE	• <i>Teacher Role:</i> The teacher assists students with generating ideas. • <i>Student Role:</i> Students discuss how to recycle more, offering specific ideas for recycling and reusing items. • <i>Tools/Materials:</i> projector, laptop • <i>Expected Output:</i> A list of different ideas
 PROTOTYPE	• <i>Teacher Role:</i> The teacher provides support and encourages active participation. • <i>Student Role:</i> Students must propose how broken or old electronic items can be used and create a new product from an old model. • <i>Tools/Materials:</i> projector, laptop • <i>Expected Output:</i> a new usable product
 TEST & ITERATE	• <i>Teacher Role:</i> The teacher provides guidance and encouragement. • <i>Student Role:</i> Students must propose how broken or old electronic items can be used and create a new product from an old model. • <i>Tools/Materials:</i> electronic devices • <i>Expected Output:</i> a new functional product

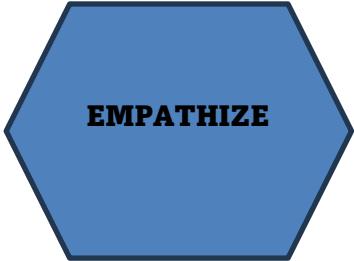
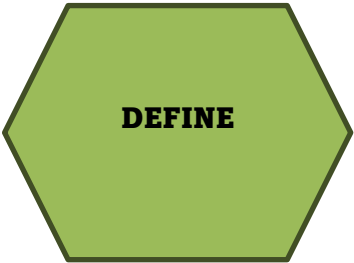
Assessment & Reflection	• The teacher monitors how the pupils are working. • Peer feedback from colleagues. • Pupils' self-reflection.
Inclusion Strategies (UDL)	• How will SEN/ELL learners be supported? • Sharing ideas deepen understanding. SEN students are part of a group, and they participate equally. • Visuals will be offered for SEN and the other learners as a part of a presentation and method of making the product.
Real-World Connection / Impact	• What impact does adopting a more environmentally friendly approach have on our future? • Students are able to create new items from old or damaged objects. • Students develop creativity and thinking skills while contributing to waste reduction.

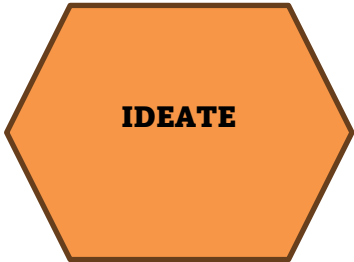
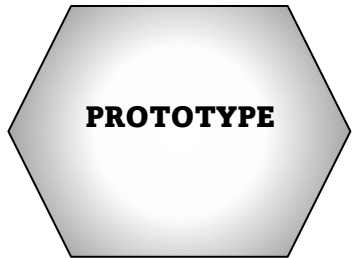
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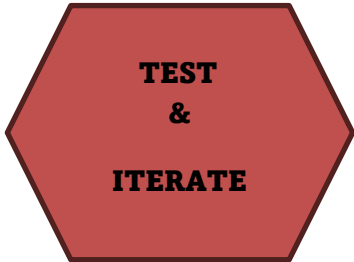
Lesson Title	Circular Economy – Critical Thinking & Ethics
Curriculum Link / Subject	Social studies, Environmental studies, Civic Education, Ethics
Circular Economy Theme	☒ Refuse ☒ Reduce ☒ Reuse ☐ Repair ☐ Recycle
Teacher	Mgr. Dominika Ružová
Grade Level	7 th -8 th graders
Time/Duration	90 minutes
Objectives	Academic/subject /thinking skills objectives 1. Develop critical thinking when evaluating products and consumption 2. Distinguish between needs and wants 3. Analyze information and advertisements 4. Work collaboratively and present ideas
	Sustainability/Circular Objectives 1. Understand the concept of circular economy 2. Compare linear vs circular systems 3. Identify waste reduction strategies 4. Reflect on ethical consumer choices

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 EMPATHIZE	• Teacher Role: Teacher facilitates a discussion using statements about consumption (e.g. buying new vs repairing, throwing away vs reusing). Teacher encourages students to share their opinions and real-life experiences. • Student Role: Students react to statements, express agreement or disagreement, and explain their reasoning. They share examples from their daily life related to consumption and waste. • Tools/Materials: Whiteboard, markers, prepared statements.
 DEFINE	• Teacher Role: Teacher introduces the concept of circular economy and explains the difference between linear and circular systems using simple examples. Teacher guides discussion with questions. • Student Role: Students listen, take notes, and participate in discussion. They compare examples and identify key differences between systems. • Tools/Materials: Projector, presentation, worksheet. • Expected Output: <i>Understanding of differences between linear and circular economy.</i>

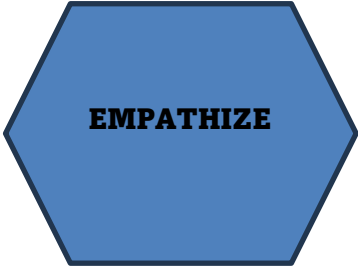
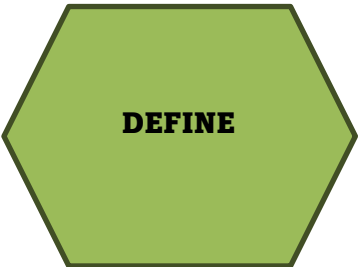
 IDEATE	• Teacher Role: Teacher encourages brainstorming and supports students in thinking creatively about improving products and reducing waste. Teacher provides examples and guiding questions. • Student Role: Students analyze everyday products and identify wasteful or unsustainable aspects. They discuss how products could be redesigned to last longer, be reused, or recycled. Students evaluate advertisements and identify how they influence consumer behavior. They brainstorm ideas for reducing waste and making more responsible choices. Groups create a list of improvements to make products more sustainable. • Tools/Materials: Worksheet, sample product images or ads. • Expected Output: List of ideas for circular solutions and product improvements.
 PROTOTYPE	• Teacher Role: <i>Teacher supports students in transforming their ideas into simple designs or concepts. Teacher provides guidance and feedback.</i> • Student Role: <i>Students work in groups to redesign a product using circular economy principles. They create a simple sketch, plan, or concept of their improved product.</i> • Tools/Materials: <i>Paper, markers, worksheet.</i>

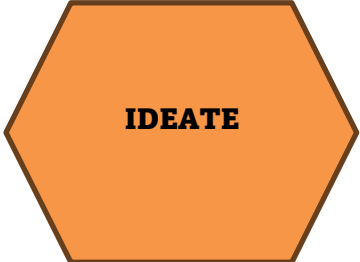
	• Expected Output: <i>Draft design of a more sustainable (circular) product.</i>
	• Teacher Role: <i>Teacher facilitates presentations and encourages constructive feedback. Teacher asks guiding questions to improve ideas.</i> • Student Role: <i>Students present their product ideas to the class. They give and receive peer feedback and suggest improvements. They reflect on how their idea could be more sustainable or practical.</i> • Tools/Materials: <i>Worksheets, presentations.</i> • Expected Output: <i>Improved product ideas and reflection on sustainability.</i>
Assessment & Reflection	• Teacher observation (participation, collaboration) • Peer feedback (discussion, presentations) • Student self-reflection (what I learned, what I would change)
Inclusion Strategies (UDL)	• How will SEN/ELL learners be supported? Use visuals (pictures of products, waste, recycling symbols) Show simple diagrams of linear vs circular economy Provide key words with icons Give short, simplified explanations alongside normal ones • Visuals will be offered for SEN and the other learners as a part of a presentation and method of making the prototype.

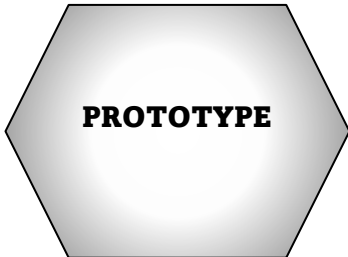
Real-World Connection / Impact	This activity helps students understand how everyday choices affect the environment and encourages more responsible consumption habits. Students may start: • repairing instead of replacing items • reducing unnecessary purchases • reusing materials in creative ways • thinking critically about advertisements and consumer pressure At school level, it can inspire: • reduced waste production in classrooms • more recycling and reuse practices • awareness campaigns about sustainability
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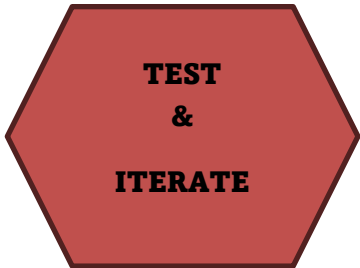
GREEN LOOP LESSON PLAN

Lesson Title	Mapping the product life cycle
Curriculum Link / Subject	Biology, Geography, Technology, Environmental Education, Computer Science (STEAM elements)
Circular Economy Theme	☐ Refuse ☐ Reduce ☒ Reuse ☒ Repair ☐ Recycle
Teacher	Mgr. Lenka Vatrálová, Mgr. Timea Holúbková
Grade Level	6 th – 8 th grade
Time/Duration	90 – 120 min
Objectives	Students will be able to: • explain the concept of a product life cycle, • identify the stages of the cycle: extraction – production – transport – use – waste, • describe where the greatest environmental impacts occur, • create their own model of a product life cycle (3D or interactive poster), • propose circular alternatives that reduce waste, • work collaboratively in a PBL process (Empathize – Define – Ideate – Prototype – Test).
Systems Thinking Elements	Connections: materials → production → use → waste → new cycle, • understanding the impacts of decisions, • identifying points where waste can be reduced, • understanding feedback loops and consequences.

 EMPATHIZE	• <i>Teacher Role:</i> ○ introduces the problem of waste and shows examples of everyday products (e.g., T-shirt, bottle, mobile phone, snack), ○ leads a short discussion: <i>“What happens to this product when we stop using it?”</i>, ○ encourages students to describe their own experiences with products that quickly turn into waste. • <i>Student Role:</i> ○ <i>express their own experiences,</i> ○ <i>identify environmental problems associated with different products,</i> ○ <i>ask questions about the origins and life cycle of objects.</i> • <i>Tools/Materials:</i> <i>Sample objects, pictures, a video about waste, sticky notes</i>
 DEFINE	• <i>Teacher Role:</i> ○ divides students into teams and explains the PBL task: <i>“Map the life cycle of one product and identify where waste is generated and how it could be reduced.”</i> ○ provides a template with the 6 life-cycle stages. • <i>Student Role:</i> ○ choose one product (e.g., notebook, T-shirt, bottle, toy), ○ describe its life cycle, ○ identify problematic stages (at least 1–2).

	• <i>Tools/Materials:</i> Life-cycle template, markers, A3 paper • <i>Expected Output:</i> <i>A life-cycle map on paper — basic analysis of the product's stages and impacts.</i>
	• <i>Teacher Role:</i> ○ introduces the challenge: “How can we adjust the product's life cycle so that less waste is generated?” ○ encourages brainstorming and offers creative techniques (6–3–5 method, mind maps). • <i>Student Role:</i> Students propose solutions related to: ○ materials that cause less environmental harm, ○ reusable alternatives, ○ improved packaging, ○ repair and extending product lifespan, ○ recycling or upcycling ideas. They then select the best solution. • <i>Tools/Materials:</i> Markers, Post-it notes

	<i>Expected Output:</i> <i>A list of ideas + selection of the best proposed solution.</i>
	<i>Teacher Role:</i> <i>ensures that students have enough creative materials,</i> <i>explains that the model should visually represent the entire life cycle of the product and show how the cycle can be improved environmentally.</i> <i>Student Role:</i> <i>Students create a model of the product's life cycle, for example:</i> <i>a 3D model of the production journey (cardboard "stations" = life-cycle stages),</i> <i>a circular flow model ("product loop") made from cardboard,</i> <i>a fold-out booklet or mock-up,</i> <i>a comic-style timeline,</i> <i>a LEGO model showing production and recycling phases,</i> <i>a box diorama with opening sections representing each stage.</i> <i>Tools/Materials:</i> <i>Cardboard, paper, waste materials, glue, scissors, LEGO, string, markers</i> <i>Expected Output:</i> <i>A completed model of the product life cycle with visually marked problem areas and suggested improvements.</i>
	<i>Teacher Role:</i> allows teams to walk around and review each other's models,

	leads reflection using guiding questions: ○ <i>What is clear and easy to understand?</i> ○ <i>What would help the viewer understand the problem better?</i> ○ <i>How clearly does the model show where waste is generated?</i> ● <i>Student Role:</i> ○ give and receive peer feedback, ○ make improvements to their model, ○ add any missing elements. ● <i>Tools/Materials:</i> <i>Markers, additional materials, paper</i> ● <i>Expected Output:</i> <i>An improved model with a brief explanation of the changes.</i>
Assessment & Reflection	Assessment focuses on: ● understanding the product life cycle, ● identifying stages where waste is generated, ● evaluating the quality of proposed solutions,

	• assessing the creativity and functionality of the model, • observing team collaboration.
Inclusion Strategies (UDL)	Reflection: • What did I learn today about the origins of the things we use? • Which stage causes the most harm to the environment? • How can we prevent waste already at the product-design stage?
Real-World Connection / Impact	Key Ideas / Big Understanding: • How will SEN/ELL learners be supported? ○ visual supports for students with learning difficulties, ○ option to work with simpler or more accessible materials, ○ vocabulary supported with pictograms, ○ option to work on a tablet for students who create better digitally, ○ team roles adapted to students' strengths. Key Ideas / Big Understanding: • every product we use daily has its own origin, journey, and “end of life”, • students understand that waste is not created only at the moment of disposal — it is generated throughout the entire life cycle, • they develop critical thinking both as consumers and as future creators/designers.

ASSESSMENT RUBRIC

Topic: Reduction of single-use dishware

Method: *PBL + STEAM + Circular Economy*

Duration: 90 - 120 minutes

Maximum score: 20 points

	4 points	3 points	2 points	1 point	0 point
EMPATHIZE - Understanding the Problem	The student/team clearly identifies the problem related to products and waste, provides specific examples, recognizes environmental impacts, and can describe user experiences (school, community).	The student understands most aspects of the problem and can provide examples of impacts, but deeper detail or precision is missing.	The student understands the problem only partially; identifies some impacts, but explanations are incomplete or superficial.	The student sees the problem only at the level of waste quantity and does not understand broader connections.	The student cannot describe the problem or its impacts.
DEFINE - Problem Definition	The team formulates a clear and precise problem statement ("How Might We...?"), identifies the causes of the problem, and defines the target context/environment	The problem is defined correctly, but a deeper analysis of the causes is missing.	The problem statement is incomplete, too broad, or ambiguous.	A minimal problem definition that does not provide clear direction for creating a solution.	No problem statement is provided.

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	(where and why waste is generated).				
IDEATE – Idea Generation	The team creates multiple original ideas that reflect the principles of the circular economy (reduce – reuse – repair – replace). They select a well-reasoned and realistic solution.	The team proposes several functional ideas, but they lack a higher level of originality or strong environmental connection.	The ideas are general or only loosely connected to the problem; the number of ideas is limited.	The team proposes only one simple idea with no clear link to the identified problem.	No solutions are proposed.
PROTOTYPE – Prototype Creation	The model is clear, aesthetic, and functional. It clearly shows all stages of the product life cycle and visually marks problematic areas as well as proposed improvements. STEAM elements are visible (construction, creativity, functional components).	The model is functional and understandable, but some parts are less developed or certain details are missing.	The model is incomplete, unclear, or shows only part of the life cycle.	The model is very simple and provides minimal information.	The model was not completed.

TEST & ITERATE – Testing and Improvements	Students actively work with the feedback, accurately identify what needs to be improved, and significantly enhance the model. They can clearly explain why the adjustments are effective.	The model has been improved and adjusted, but the explanation of changes is not sufficiently in-depth.	Improvements are minimal or superficial; feedback was used only partially.	The adjustments do not meaningfully affect the quality of the model; feedback was not used effectively.	There was no testing or no improvements made to the model.
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Bonus Category (optional): Presentation (0–2 points)

(Does not count toward the required maximum of 20 points — can be added as a motivational category.)

2 points: A clear, convincing presentation in which all team members participated.

1 point: A basic presentation.

0 points: No presentation.