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GREEN LOOP

TEACHERTRAININGMODULES

A

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Module 1 – Understanding the Circular Economy: A Practical Guide for Teachers

Aim

This module introduces the basic principles of the circular economy in a clear and simple way. It helps teachers understand how circular thinking can reduce waste and support sustainability. By the end, teachers will have tools and ideas to reflect on their own habits and to create easy-to-use activities for their students.

Learning Objectives

By the end of this module, teachers will be able to:

- Define the 5Rs (Refuse, Reduce, Reuse, Repair, Recycle) and why they matter.
- Explain the difference between linear and circular economies using real-life examples.
- Identify key environmental problems linked to waste and overconsumption.
- Reflect on how their own habits create waste or support sustainability.
- Plan a simple classroom activity or project that includes one or more of the 5Rs.

Core Content

Core topics you will explore in this module:

- The 5Rs of waste: What they mean and how to use them in your classroom
- Linear vs Circular Economies: Simple diagrams and examples
- Where waste goes: Landfills, oceans, electronics
- Everyday choices that matter: How food, packaging, and travel habits impact sustainability



Linear Economy

Linear Economy

A linear economy is a traditional way of producing and using goods. In this system, we take resources from nature, make products, use them, and then throw them away. This is called a "one-way" or "single-use" model.

This means:

1. Take – We extract natural materials from the environment (like oil, trees, or minerals).
2. Make – We turn these materials into products, using energy and machines.
3. Use – People use the products, often only once or for a short time.
4. Dispose – When we no longer need them, we throw them away. They usually end up in large waste areas (landfills) or are burned (incinerated).



Source: Hartmann, C. G. (2018). Exploring the role of independent retailers in the circular economy: A case study approach (Master's thesis). Used for educational purposes.

Why is the Linear Economy Problematic?

Why is this a problem?

- It treats nature as if resources will never run out.
- It creates too much waste and pollution.
- It increases climate change and harms plants, animals, and ecosystems.
- It encourages companies to make cheap, short-use products instead of long-lasting ones.

Circular Economy

Circular Economy

A circular economy is a way of using resources in a smarter and more sustainable way. Instead of creating waste, this system aims to keep products and materials in use for as long as possible. It also protects nature and supports healthy ecosystems.

Instead of the traditional “Take–Make–Dispose” pattern in the linear economy, the circular economy follows a closed loop approach:
Make → Use → Reuse/Repair → Recycle → Make Again

The circular economy is based on three key ideas:

1. Design out waste and pollution

This means creating products in a way that prevents waste before it happens.

Example: Using fewer materials or making items easy to repair.

2. Keep products and materials in use

Items should be used again and again. They can be reused, shared, repaired, or recycled.

Example: A broken chair is fixed instead of thrown away.

3. Regenerate natural systems

Nature is part of the cycle. We should return nutrients to the soil and use clean energy sources.

Example: Composting food waste or using solar energy.

The circular economy model:
less raw material, less waste, fewer emissions



Source: European Parliament Research Service



THE DIFFERENCE BETWEEN LINEAR AND CIRCULAR ECONOMY



Source: Behún & Behúnová (2023), Advanced Innovation Technology of BIM in a Circular Economy, Appl. Sci., 13(13), 7989. Licensed under CC BY 4.0.

Think-Pair-Share:

What kinds of products in your school or home follow a linear model? How could they become more circular?

Understanding the 5Rs: A Simple Tool to Reduce Waste

The 5Rs are one of the most important ideas in the circular economy. They give us a clear and simple way to reduce waste and use products for longer.

Here's what each "R" stands for:

1. **Refuse** – Say no to things we do not need. Avoid unnecessary packaging, single-use plastics, and products that create waste by design.
Example: Saying no to a plastic straw at a café.
2. **Reduce** – Try to use less. Choose products that last longer and create less waste.
Example: Printing on both sides of paper or using a reusable water bottle.
3. **Reuse** – Use things more than once. You can share, borrow, or repurpose them.
Example: Using a glass jar to store food at home.
4. **Recycle** – Turn old materials into something new. Recycling comes after you try to refuse, reduce, and reuse. Recycling should come after refusing, reducing, and reusing.
Example: Sorting paper, plastic, and metal into separate bins.
5. **Repair** – When something breaks, try to fix it instead of throwing it away. This saves materials and money.
Example: Sewing torn clothes or fixing a broken chair.



ACTIVITY 1.1: Waste in My Day: Discovering the 5Rs

Purpose of this Activity	This activity helps teachers link circular economy ideas to their real lives. By observing the waste they create during a normal day, they begin to reflect on personal habits and connect them to the 5Rs (Refuse, Reduce, Reuse, Repair, Recycle). This is a gentle and accessible way to shift from linear to circular thinking — before redesigning anything.		
Materials Needed - Pen and paper or a digital notetaking tool - 24-hour reflection sheet (provided as template or simply use a notebook) - Optional: access to Jamboard, Padlet, Flip or Google Forms for sharing thoughts			
Step 1 – Observe your own waste (Day before the session or as homework) Keep a simple record for one day. Write down or photograph 3 to 5 items you threw away or used once. Examples: - Coffee cup - Packaging from food - Broken pen - Printed worksheet - Tissue paper Optional columns: - What was the item? - When and where did you use it? - How long did you use it before throwing it away?	Step 2 – Reflect using the 5Rs Choose two or three of the items you listed. For each one, ask: - Could I have refused this item? - Could I have reduced its use or size? - Could I have reused it instead of using it once? - Could I have repaired it (if broken)? - Could I have recycled it properly? Write a short note for each item: what you did, what you could have done differently.		Step 3 – Identify your habits Looking at your answers, think: - Which “R” do you already use the most? - Which “R” is missing from your habits? - Which small action could you try next week to improve?
			Step 4 – Connect it to the classroom Imagine you are doing this activity with your students. Answer: - How would you adapt it? (e.g., shorter version, focus on school canteen waste?) - Which age group would it suit best? - What kind of discussion or follow-up would you do? Optional: Write a simple classroom version idea using this prompt: “To help my students think about waste, I would ask them to _____.”

ACTIVITY 1.2: From Bin to Blueprint: Rethinking Everyday Products

Purpose of this Activity

In this activity, we explore the full lifecycle of a familiar object— from resource extraction to disposal. By analysing its journey, we'll uncover where and why waste occurs. Then, we'll reimagine the object using principles from the circular economy. This process helps us move from awareness to action and prepares us to introduce similar thinking into our classrooms.

Materials Needed

- One common object per group (e.g., snack wrapper, pen, disposable cup, plastic folder)
- A3 paper or “Redesign Canvas” template
- Sticky notes, markers, scissors (optional)
- Optionally: access to Jamboard, Canva, or Flip for digital presentation

Step 1 – Let's Trace the Journey (10 minutes)

We start by mapping the current life cycle of the object. Where does it begin? How is it used? Where does it end up?

We can use arrows, sketches or lists to visualise this process.

Let's think in terms of a typical linear model:

Take → Make → Use → Dispose

Step 2 – What Makes This Object Wasteful? (10 minutes)

Let's now identify why this object becomes waste:

- Is it designed for single use?
- Is it made of mixed or hard-to-recycle materials?

Is it difficult or impossible to repair or refill?

We can write down two or three key issues with its design or use.

Step 3 – Let's Rethink and Redesign (15 minutes)

Now we'll shift perspectives and explore how this object could be redesigned for a circular system:

Make → Use → Reuse/Repair → Recycle → Make Again

Together or individually, we sketch a redesign that:

- Uses fewer or renewable materials
- Is easier to reuse, refill, or repair
- Has a longer lifespan
- Avoids becoming waste

We can present our redesign as a drawing, a product concept, or a mock-up.

Step 4 – Share Our Designs (10 minutes)

Let's take time to walk around, look at each other's ideas, and offer kind feedback:

- What was the most creative solution?
Which design felt most realistic or useful in a school context?
- What could we apply directly in our classrooms?

Step 5 – Reflect on What We've Learned (5 minutes)

Finally, let's pause to reflect:

What is one change we can make — as teachers or school communities — to reduce waste or support circular habits?

Worksheets for 'From Bin to Blueprint'

LIFE CYCLE MAPPING: THE JOURNEY OF A PRODUCT

Product Name:	What materials is it made from?	Where is it manufactured?
How is it transported and used?	What happens after it's thrown away?	What part of the design causes the most waste?

CIRCULAR REDESIGN CANVAS

Problems with the current design:	Sketch your redesigned product: [Use the space below to draw or describe your redesigned product]	
How does your new design avoid waste?	Which 5Rs are reflected in your design? (Tick all that apply) ☐ Refuse ☐ Reduce ☐ Reuse ☐ Recycle ☐ Repair	Could this design be used in a school context? How?

Suggested Use of Digital Tools

To support sustainability goals and reduce paper use, this activity can be carried out using digital tools instead of physical worksheets.

Depending on your teaching context, the following platforms are recommended:

- Google Forms – to track and record daily waste reflections
- Canva or Google Sheets – to create digital infographics, charts, or reflection posters
- Padlet – to collect and share redesign ideas and reflection posts
- Jamboard – for visualising the product's life cycle in groups
- Flip or Loom – to create short video explanations of redesigned products

These tools allow for creativity, collaboration, and easy sharing of ideas. Feel free to adapt based on your digital context and comfort level.

ACTIVITY 1.3: Map Your School: Understanding Material Flows and Circular Opportunities

Purpose of this Activity

This activity invites teachers to step into the role of a systems thinker. By tracing how materials (like paper, plastic, or food waste) move through their school, teachers will develop a better understanding of resource use and waste. This hands-on activity builds awareness of the hidden systems behind everyday items—and opens the door to small, achievable circular changes. The system map you create will also help you design classroom activities that are place-based and meaningful for students.

Materials Needed

- Pen and A3 paper or a large notebook
- Optional: Google Jamboard, Canva, Coggle.it, or Miro (for digital mapping)
- Optional: Access to your school's staffroom, storage area, or janitor for real-world input

Step 1 – Choose 2–3 Items from Your School Environment

Start by picking a few items that are regularly used and often discarded at school. Examples include:

- Paper towels
- Plastic bottles or food containers
- Disposable pens or markers
- Paper worksheets
- Snack wrappers
- Glue sticks or folders

These items can be from classrooms, staffrooms, offices, or the canteen.

Step 2 – Investigate Their Journey

For each item, ask yourself the following questions. You can use a simple chart to write your answers.

Item	Where does it come from?	Who uses it?	How is it disposed of?	Could it be reused/recycled?

If possible, ask your school's cleaner, caretaker, or administrator to learn more about how materials are bought, used, and discarded.

Step 3 – Create a Simple System Map

Now turn your notes into a simple drawing. You can use arrows, icons, or sketches to show how one item flows through your school:

Example Flow:

Ordered → Used in class → Thrown away → Recycled or Sent to landfill
Try to show:

- Where the item starts (supplier/delivery)
- Where it goes (classroom, canteen, etc.)
- Where it ends (bin, recycling, storage)
- Loops, leaks, and loss of value

You can do this by hand or using a digital tool like Jamboard, Lucidchart, or Google Drawings.

Step 4 – Reflect Using Systems Thinking

Now, look at your map and consider:

- Where is most waste created?
- Is there a point where reuse or recycling could happen—but doesn't?
- Which part of the system could you improve with a small change?

Write a few sentences reflecting on your answers.

Step 5 – Imagine a Small Intervention

What's one small circular idea you could propose or try in your school?

Examples:

- Replace plastic cups with reusable ones in the staffroom
- Create a paper scrap reuse box in the photocopy area
- Introduce a pen refill station instead of buying new pens

Write your idea using this prompt:

"One small change I could make in my school to reduce waste is _____ because _____."

REFLECTION

1. What surprised you about your product's journey or your school's material flows?

Think about what you discovered when tracing everyday items or mapping a system at school.

2. What was most challenging about redesigning a product or mapping a system?

Was it difficult to imagine alternatives? Did you realise something was more complex than expected?

3. What are the biggest sources of waste in your school or classroom?

Are they obvious (like bins) or hidden (like digital printing habits or excess packaging)?

4. How did systems thinking help you see waste or sustainability in a new way?

What connections did you notice that you hadn't before?

5. Which of the 5Rs are easiest for you to apply—and which are most difficult?

Why do you think that is?

6. What is one action you will take—either as an individual or in your school—to reduce waste or support circular practices?

7. How could you adapt one of these activities for your students?

Would you change the tools, time, or focus area to suit their level and context?

MODULE 2- Systems Thinking, Sustainability, Design Thinking & Design-Based Learning

Module Overview

This module helps teachers understand and apply systems thinking as a foundational tool in sustainability education. Participants will explore how environmental, social, and economic systems are interconnected, and how the circular economy provides a strategic framework for holistic solutions.

Through interactive activities, design-based simulations, and reflection tasks, teachers will develop the skills to guide their students from surface-level awareness to deep system-level understanding.

Intended Learning Outcomes

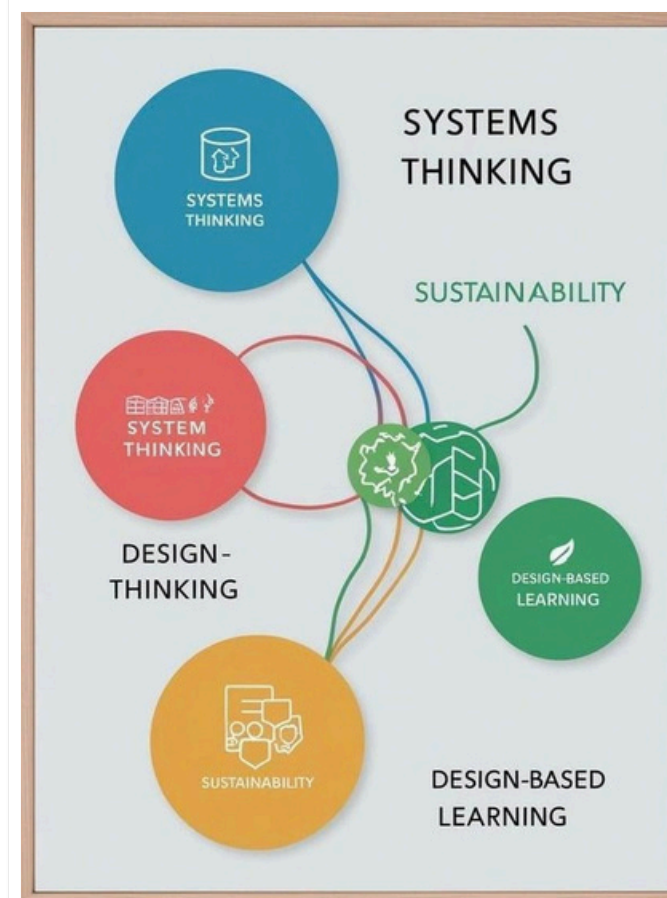
By the end of this module, participants will be able to:

- Define systems thinking and explain its value in sustainability education
- Analyse a familiar product or issue using a systems lens
- Connect circular economy strategies to multiple Sustainable Development Goals (SDGs)
- Facilitate digital and design-based learning activities that promote systemic thinking
- Plan lessons that integrate interdisciplinary, problem-based learning approaches

How to Use This Module

This module includes:

- Background readings to build conceptual understanding
- Hands-on activities for classroom adaptation
- Collaborative digital mapping challenges
- Design thinking simulations
- Reflection prompts and suggested tools for each stage



What is System Thinking?

Systems thinking is a way of seeing the world as a **web of relationships**, rather than isolated parts. It helps us understand that **environmental problems are not caused by a single factor**, but by many interconnected causes.

For example, a plastic bottle is not just “waste.”

It is connected to:

- Oil extraction
- Manufacturing systems
- Transport emissions
- Recycling infrastructure
- Consumer habits
- Marine ecosystems
- Climate impact

With systems thinking, we ask:

“What affects what?”

“If this changes, what else is impacted?”

“Where could we intervene for the biggest effect?”

As sustainability educators, systems thinking helps us guide students toward a deeper understanding. It trains them to look beyond surface-level symptoms (e.g., plastic pollution) and explore root causes (e.g., consumption patterns, product design, policy gaps). It also supports critical thinking and holistic problem-solving.



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Circular Economy, SDGs and Systems Thinking

The circular economy is not just about managing waste — it's about rethinking how systems function in order to create long-term value for people and the planet. When viewed through a **systems thinking lens**, it becomes clear that circular strategies directly support multiple **Sustainable Development Goals (SDGs)**, not just SDG 12.

For example:

- By **reducing waste and improving resource efficiency**, circular practices directly contribute to **SDG 12: Responsible Consumption and Production**.
- By **lowering emissions and using renewable energy**, they support **SDG 13: Climate Action** and **SDG 7: Affordable and Clean Energy**.
- Through **reuse, shared infrastructure, and low-impact design**, they help shape **SDG 11: Sustainable Cities and Communities**.
- Cleaner production and product innovation align with **SDG 9: Industry, Innovation and Infrastructure**.



- Preventing pollution and overextraction contributes to **SDG 6: Clean Water**, **SDG 14: Life Below Water**, and **SDG 15: Life on Land**.
- The creation of new green jobs in repair, remanufacturing, and reuse sectors supports **SDG 8: Decent Work and Economic Growth**.

Systems thinking helps us recognise that circular actions taken at one point in a system — such as design, production, or disposal — can ripple across multiple sectors and goals. This approach makes circular economy not just a technical solution, but a strategic method for advancing holistic sustainability.

ACTIVITY 2.1 Seeing Systems: From Insight to Action

1. System Thinking: Estimated time: 10–15 minutes

Choose a product you use regularly (e.g., cotton T-shirt, smartphone, school lunch tray).
Write or sketch at least 5 connected systems or actors (e.g., agriculture, energy, marketing, transport, recycling).

Reflection prompts:

- What affects what?
- Where is the waste or impact hidden?
- What would happen if one part of this system changed?

2. Digital System Mapping Challenge (30–45 min) Instructions

Work in small groups to map a chosen product or process (e.g., bottled water, school printing, fast fashion).

Use **Jamboard**, **Canva**, or **Lucidchart**.

Tasks:

- List system elements (production, supply chains, user behaviour, waste outcomes, etc.)
- Draw arrows to show relationships and feedback loops
- Identify leverage points (where 5Rs or design could reduce negative impacts)

3. Share and Reflect (10–15 min)

Post your group map on Padlet or present it.

Use these guiding questions:

- Which connection surprised you most?
- Which part of the system seems most fragile or unfair?
- How might students do this activity in your classroom?

To enhance collaboration, reduce paper waste, and align with circular economy values, the use of digital tools is encouraged throughout this activity. Depending on your context and preferences, the following tools may support different stages of the process:

- **Jamboard or Miro** – for collaborative system mapping
- **Canva or Lucidchart** – for creating structured and visually rich system diagrams
- **Padlet or Google Docs** – for sharing reflections and peer feedback
- **Mentimeter** – for live polls or whole-group insights
- **Animaker or Adobe Express** – for optional storytelling or digital presentations

You are welcome to adapt these tools as needed, or to use other digital platforms you are familiar with. What matters most is engaging with systems thinking in a way that is meaningful, inclusive, and sustainable.

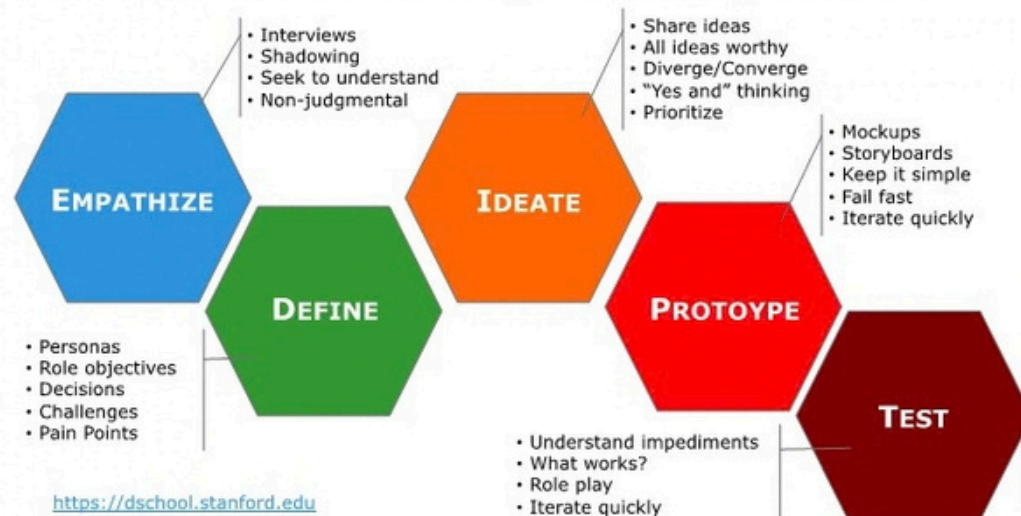
Design Thinking

Design thinking is a problem-solving approach that places **human needs, creativity, and iterative learning** at the centre of innovation. Originally developed in product and service design, it is now widely used in education to help students and teachers address complex real-world problems — including those related to sustainability and the circular economy.

It is structured around five key phases:

1. **Empathise** – Understand the user and the context.
In sustainability education, this could mean listening to the experiences of students, families, or communities affected by waste or pollution.
2. **Define** – Identify the root problem. Go beyond symptoms. For example, instead of saying “too much plastic,” define the issue as “how might we reduce plastic use in our daily school routines?”
3. **Ideate** – Brainstorm a variety of creative solutions.
No judgement — the goal is quantity and creativity.
4. **Prototype** – Turn ideas into small-scale versions: posters, models, flowcharts, mock apps, etc.
5. **Test & Iterate** – Try it out. Gather feedback. Improve.

Stanford d.school Design Thinking Process



Design Thinking - Circular Economy

Circular economy is about redesigning systems — and so is design thinking. Both value experimentation, feedback, and solutions that consider the bigger picture. Teaching students to think like designers helps them become problem-solvers, not just problem observers.

Design-Based Learning (DBL)

Design-Based Learning (DBL) is a student-centred instructional method that uses the design process to engage learners in solving real-world problems. It combines creativity, research, prototyping, feedback, and revision in a cyclical process that fosters deep understanding and practical skills. In a DBL classroom, students are not passive receivers of knowledge they are designers, builders, collaborators, and reflective thinkers.

In a DBL classroom:

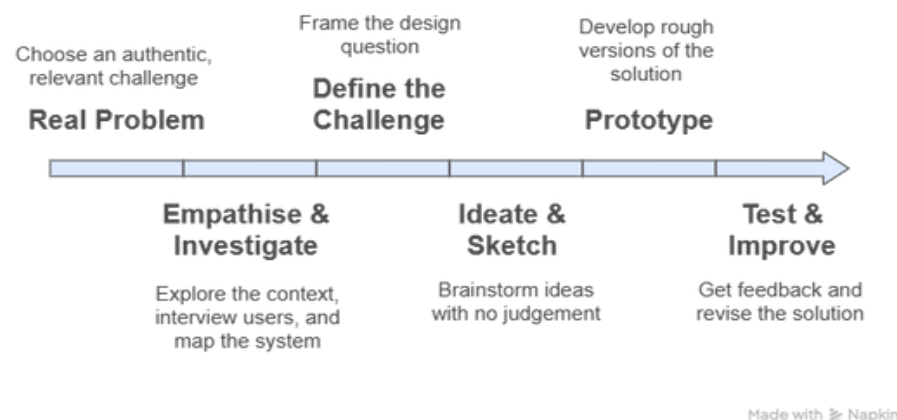
- Students learn by **doing**
- The teacher becomes a **facilitator**, guiding inquiry and design
- Learning is **interdisciplinary** — linking science, technology, art, ethics, and communication
- Success is not based on the “correct answer” but on iteration and impact

DBL helps students explore complex environmental issues like plastic waste, water use, or energy by empowering them to design solutions, not just identify problems.

This method aligns perfectly with systems thinking, SDGs, and circular economy, as it encourages:

- Real-world application of concepts
- Interdisciplinary learning
- Resilience and iteration
- Student ownership and agency

Planning a DBL-Based Sustainability Lesson



Steps to design a DBL-based lesson plan:

1. Real Problem Choose an authentic, relevant challenge in your school or community. *Example: single-use plastics in the cafeteria.*
2. Empathise & Investigate Guide students to explore the context, interview users, and map the system.
3. Define the Challenge Frame the design question. *Example: "How might we reduce plastic waste during lunch breaks?"*
4. Ideate & Sketch Brainstorm ideas with no judgement. Encourage creativity and quantity.
5. Prototype Develop rough versions of the solution (posters, campaigns, tools, new routines). Use digital or physical materials.
6. Test & Improve get feedback from peers or stakeholders and revise the solution. Ask: What worked? What can be improved?

ACTIVITY 3: Walk in the Shoes: A Design Thinking Simulation

Duration: 60–75 minutes

Tools: Canva, Jamboard, Flip, paper, markers, sticky notes

Scenario

Your class generates significant waste from photocopies, snack packaging, and daily materials. There is no structured zero-waste program in the school, and students seem unaware of the environmental impact. How might we design a creative and engaging solution that helps students reduce waste and adopt sustainable behaviors?

Learning Outcomes

- Understand and experience the full design thinking cycle
- Apply creative problem-solving to sustainability challenges
- Collaborate and communicate within a team
- Reflect on the process and its classroom application

1. Empathize – Understand the Users (10 min)

Role-play as different people affected by the issue (e.g., student, teacher, janitor, parent). Discuss their experiences and pain points. Use empathy maps to capture their feelings, needs, and behaviours.

2. Define – Clarify the Core Problem (5–10 min)

Narrow down the insights to formulate a clear problem statement. Instead of 'there is too much waste,' reframe the issue: 'How might we reduce classroom waste while making students part of the solution?'

3. Ideate – Generate Ideas (10–15 min)

Brainstorm a wide variety of ideas. Encourage wild, creative thinking with no judgement. Each group should aim for at least 10 ideas in 5 minutes. Then, vote on the top 1–2 ideas to develop further.

4. Prototype – Visualize the Solution (15–20 min)

Sketch, draw, or digitally present the selected idea using Canva, Jamboard, Flip, or paper tools. Create a visual or conceptual prototype (e.g., poster, toolkit, redesigned object, campaign plan).

5. Test & Reflect – Present and Get Feedback (10–15 min)

Each group presents their prototype. Peers provide feedback based on feasibility, creativity, and impact. Groups note how they would improve their design based on comments.

Empathy Map	Define	Ideation Board	Prototype	Test & Reflect – Share and Improve
Participants take on roles such as student, teacher, janitor, or parent. They discuss how each role is affected by the problem and complete the Empathy Map worksheet. User Role: Think about this user. What do they: 1.SAY and DO? 2.THINK and FEEL? 3.SEE and HEAR? 4.NEED or WANT?	Based on the empathy findings, groups frame a clear and focused design challenge. Example: “How might we reduce classroom waste while engaging students in the process?”	Groups brainstorm as many ideas as possible (aim for 10+ ideas). Then they select the most promising 1–2 ideas using the Ideation Worksheet. Write as many ideas as possible below. Focus on quantity over quality. Top 2 ideas to develop further:	The selected idea is turned into a quick prototype — a poster, sketch, digital design, or action plan. Tools may include Canva, Flip, Jamboard, or physical materials.	Each group presents their solution. Peers give structured feedback using the Peer Feedback Form. Groups reflect on their process using the Reflection Sheet and discuss how to improve.
To support each stage of the design thinking process, simple Web 2.0 tools can be used. Jamboard and Padlet are ideal for empathy maps and gathering ideas. Google Docs or Canva Whiteboard help teams define problems and organise thinking. For creative idea generation, Miro or Canva allow for quick visual brainstorming. When prototyping, Canva or Genially are great for posters or mock-ups. For feedback and reflection, tools like Flip and Google Forms enable easy sharing and evaluation. Using these tools helps model sustainability and supports interactive, paper-free learning.				

MODULE 3-Designing Circular Solutions

Module Overview

This module equips teachers to guide students through the full cycle of **Project-Based Learning (PBL)** integrated with **Design-Based Learning (DBL)**. Students are empowered to identify real-world sustainability problems, develop creative circular solutions, and present their work through tangible, impactful outcomes.

The module builds on the conceptual and design foundations introduced in Modules 1 and 2. While Module 2 focuses on *thinking like a designer*, Module 3 helps teachers support students to *act like designers* – planning, prototyping, and showcasing real solutions to real problems using **5Rs, systems thinking, and life cycle awareness**.

Through inquiry, iteration, and product creation, students explore how circular economy principles can be meaningfully applied within school and community contexts – making learning both purposeful and practical.

Intended Learning Outcomes

By the end of this module, participants will be able to:

- Design and facilitate student-led projects grounded in circular economy challenges
- Apply PBL and DBL methods to support iterative solution development
- Guide students in creating and refining digital or physical circular economy products
- Use digital tools to support collaboration, creativity, and communication

Assess learning processes and outputs through peer feedback and reflective tools

How to Use This Module

This module includes:

- Step-by-step guidance for combining PBL and DBL
- Activity examples for identifying problems, designing solutions, and sharing outcomes
- Templates for project planning, prototyping, and assessment
- Suggestions for cross-curricular links and community engagement
- Tools for digital creation, collaboration, and reflection

Tools recommended: Canva, Flip, Scratch, Tinkercad, Jamboard, Google Forms

ACTIVITY 3.1A: Discover & Define: What's the Problem?

Objective:

To help you identify and analyse a real-world sustainability problem in your school or local environment using basic observation and systems thinking.

Outcome of this Activity:

You now have:

- A clearly defined **circular economy challenge**
- A basic understanding of the system behind it
- A **design question** to guide your project or lesson

Step 1 – Choose a Focus Area (10 minutes)

Think about your school environment. Where might sustainability problems exist? Examples include:

- The school cafeteria (food waste, single-use plastics)
- Classrooms (paper usage, broken materials)
- Playground or garden (litter, resource use)
- Energy use (lights, heating, electronics left on)

**Write down one area you want to explore.*

Step 2 – Observe and Take Notes (15 minutes)

Visit the area (physically or mentally) and ask yourself:

- What is being wasted? (e.g., plastic wrappers, electricity, paper)
- Who uses the space? (e.g., students, teachers, staff)
- What behaviours contribute to the issue? (e.g., not sorting waste, leaving lights on)
- What resources are involved? (e.g., packaging, water, materials)

** Use a Jamboard or Padlet to list all the problems you notice in the space. You can write keywords, draw, or even add photos.*

Step 3 – Map the Problem (15 minutes)

Create a visual "Problem Map." At the centre, write the issue (e.g., "cafeteria waste").

Then around it, add related ideas:

- **Causes:** Why is it happening?
- **Impacts:** Who/what is affected?
- **Opportunities:** What could be changed?

Use arrows or colours to connect causes and consequences. Don't worry about being perfect – the goal is to **see the system**.

Step 4 – Ask the Right Questions (10 minutes)

Now use these guiding questions to move from problem to design challenge:

- What is the root cause of this issue?
- What small change could lead to a big difference?
- Who would benefit from a solution?
- What part of this system could be redesigned?

**Tip: Ask "What affects what?" and "What could we improve?"*

* Step 5 – Write Your Design Question (10 minutes)

Now you are ready to write a clear and focused design challenge using the "How might we..." format.

Examples:

- *How might we reduce plastic waste in our school snacks?*
- *How might we encourage students to use less paper?*
- *How might we make sorting bins easier to use?*

** Share your question with a peer or write it on a Padlet wall to inspire others.*

Activity 3.1B: Mapping the Life of Materials and Rethinking Waste

Objective:

To help you develop system thinking skills by tracing the full life of a familiar school item, then redesigning it using circular economy principles such as reuse, repair, or redesign.

Outcome of this Activity:

- A mapped lifecycle of a common classroom item
- A redesign idea that makes the item more circular
- A deeper understanding of material flows in your school

Step 1– Select a Common Object (10 minutes)

Pick one object you or your students use frequently in school. Some examples include:

- Disposable pens or glue sticks
- Plastic folders or snack wrappers
- Paper towels or worksheets

*Write the object name at the top of your page or on a sticky note.

Step 2– Trace Its Journey (15 minutes)

Use the prompts below to track the object's journey:

- What is it made from?
- Where was it produced?
- How did it arrive at school?
- Who uses it and how?
- Where does it go after use?

* Ask: How long does this object stay useful before it's thrown away?

Step 3 – Draw Its Lifecycle (15 minutes)

On A3 paper or digitally (e.g., Canva or Jamboard), create a diagram showing the linear lifecycle of the object.

Include:

- Arrows to show each stage
- Icons, labels or short notes (e.g., factory, transport, classroom, bin)

*Add colour or sketches if you'd like.

Step 4 – Rethink the Design (15 minutes)

Now redesign the product using circular economy principles:

- Could it be refillable, reusable, or compostable?
- Could the material be changed to make it last longer or be recycled?
- Could the item be shared or replaced with a digital solution?

*Draw your redesigned product and show the new circular lifecycle.

Step 5 – Share and Reflect (10 minutes)

*Share your redesigned product and lifecycle with a colleague or on a Padlet wall.

Then reflect:

- What was the biggest surprise in this activity?
- What would it take to make your redesign real in your school?
- How could students do a similar mapping and redesign task?

Activity 3.2: Discover & Define: What's the Problem?

Objective:

To help you or your students brainstorm, design, and prototype a creative, sustainable solution to the problem identified in Activity 1 using circular economy principles and digital tools.

Outcome of this Activity:

You now have:

- A tested **solution idea**
- A **working prototype** that represents it
- A plan to share it and get feedback

Step 1 – Revisit Your Design Question(5 minutes)

Look back at the “How might we...” question you created in Activity 1. Example:

How might we reduce plastic packaging waste in school snacks?

Make sure the question is:

- **Focused** (about one issue)
- **Actionable** (can lead to a solution)
- **Creative** (allows for multiple answers)

Step 2 – Brainstorm Ideas (15 minutes)

Use Jamboard, sticky notes, or a large paper to generate as many ideas as possible.

**Tip: Quantity first, quality later!*

Think wildly, creatively, and without judgement.

Ask:

- What could we create, design, or change?
 - Could it be a new tool? A poster? A new routine?
 - How can we apply 5Rs? (Refuse, Reduce, Reuse, Recycle, Repair)
- Example Ideas:
- Reusable snack bags
 - “Waste-Free Snack Day” campaign
 - Sorting bin labels and reminders
 - Scratch game that teaches sorting

Step 3 – Select Your Idea (10 minutes)

Vote or discuss to choose **1 strong idea** to develop. Use simple criteria:

Is it **practical**?

Is it **creative**?

Does it support circular thinking?

**“If we could only build one thing — what would have the biggest positive impact?”*

Step 4 – Build a Prototype (20–30 minutes)

Now it's time to make a basic version of your solution. Your prototype can be:

- A **poster or infographic** (Canva, Genially)
- A **video or voice pitch** (Flip, Loom)
- A **3D model or mock-up** (Tinkercad, paper, cardboard)
- A **digital concept** (Scratch animation, Padlet board)

**Don't worry about perfection — this is a first version. Focus on expressing your idea clearly!*

Step 5 – Prepare to Test It (5 minutes)

Think about:

- Who will you share it with? (your classmates, other teachers, parents?)
- What kind of feedback would help improve it?
- What questions do you have about your own solution?

Optional: Create a Google Form or reflection sheet to gather feedback from viewers.

Activity 3.3: Share & Reflect: Make it Public

Objective:

To give students the opportunity to present their circular solutions, receive peer feedback, and reflect on their learning process — reinforcing ownership, visibility, and real-world relevance.

Outcome of this Activity:

Students complete the full **design and learning cycle**:

- They **present** their work
- They **receive feedback**
- They **reflect** on what they did and learned

Step 1 – Prepare to Share (10–15 minutes)

Ask students to prepare a short presentation of their prototype or campaign. They can choose the format:

- Flip video (2–3 minutes)
- Canva / Genially presentation
- Poster or physical model with oral explanation
- Class website entry or mini-exhibit

* Encourage them to explain:

- What problem they addressed
- What their idea was and how it works
- How it applies circular economy principles
- What impact it could have

Step2– Present to an Audience (20–30 minutes)

Organise a classroom showcase, gallery walk, or digital exhibition. Audience could include:

- Classmates
- Teachers or school staff
- Parents or community members

*Format ideas:

- Flip video wall or QR code posters
- Padlet board for all projects
- Canva pitch deck on screen

Make sure each group gets a few minutes to present and answer a question or two.

Step 3 – Collect Peer Feedback (10–15 minutes)

Give students a simple **feedback form** or **Google Form**. Example prompts:

- What do you like most about this solution?
- What could be improved?
- How does it show circular thinking?

Optional: Use **Mentimeter** to collect live feedback or reactions.

Step 4 – Reflect on the Process (15–20 minutes)

Ask students to write or record a **personal reflection**.

Prompts:

- What did I learn about sustainability and design?
- What part of the project was hardest?
- What would I do differently next time?
- What can I apply in real life from this experience?

Formats:

- Google Doc / Reflection journal
- Flip video
- Illustrated poster (Canva or by hand)

MODULE 4-Acting as Circular Change Agents

Module Overview

This final module builds on the previous ones by shifting from prototyping to **real-world implementation and outreach**. Students move from “thinking like a designer” to “acting like a change agent.” Teachers support this shift by enabling campaigns, partnerships, and community engagement grounded in circular economy thinking.

Intended Learning Outcomes

By the end of this module, participants will be able to:

- Guide students to act as circular economy advocates and problem-solvers
- Support students in planning and implementing school-wide sustainability actions
- Integrate stakeholder collaboration and civic engagement into circular learning
- Use creative and digital tools to amplify visibility and impact
- Evaluate the effectiveness and learning outcomes of action-based projects

How to Use This Module

This module includes:

- Sample action projects and school-based examples
- Templates for stakeholder mapping, campaign planning, and evaluation
- Tools for documenting and disseminating impact
- Peer and self-assessment tools for student reflection
- Flexible timing: 3–4 classroom sessions + 1–2 weeks for project implementation

Activity 4 .1: Map the Opportunity

Objective:

To help students identify and analyse real sustainability problems in their school or community and uncover opportunities for circular economy actions.

Outcome of this Activity:

Students will have:

- A visual sustainability map showing school-based problems and possible interventions
- Identified key stakeholders and areas for improvement
- Selected one focus area for action in the next phase

Step1 – Scan Your School or Community (15 minutes)

Explore your school spaces to observe where sustainability problems exist. Possible areas:

- Cafeteria (food waste, packaging)
- Classrooms (paper use, energy waste)
- Toilets (water usage)
- Corridors (lighting, unused items)
- Playground/garden (litter, biodiversity)

* Tip: Walk around and take notes or photos of observed issues. If mobility is limited, conduct a “mental walk-through” or interview peers.

Step 2 – List the Problems (10 minutes)

Create a shared list of all the problems students observed or discussed. Use Padlet, Jamboard, or a whiteboard.

Prompts to guide thinking:

- What resources are being wasted?
- What behaviours are causing the problem?
- Who is involved in the system?

Step 3 – Build a Circular Opportunity Map (20 minutes)

On a large paper or digital whiteboard, write the chosen space or issue at the centre (e.g. “School Cafeteria Waste”). Around it, add:

- **Causes** – What leads to this problem?
- **Impacts** – Who/what is affected?
- **Stakeholders** – Who uses or manages the space?
- **Opportunities** – What could be changed or improved?

*Use arrows and colours to show links and influence (systems thinking). Don’t worry about perfect design – this is an exploratory map.

Step 4 – Prioritise One Action Area (10 minutes)

As a group, decide on one area to focus on in the next activity. Criteria to consider:

- **Feasibility:** Can we take action on this in our school?
- **Relevance:** Does it affect many people?
- **Impact:** Would small changes create big results?

* Example selected topics:

- Reducing food packaging waste
- Reusing old school supplies
- Creating a uniform swap system
- Fixing unused items

Step 5–Share and Document (5–10 minutes)

Groupsshare their maps with others and brieflypresent their chosen focus area. Use Flip,posters, or Google Slides to documentthe findings.

Activity 4.2: Campaign & Action Planning Lab

Objective:

To enable teachers to design a targeted, achievable, and creative circular economy action or campaign that can be implemented within their school environment.

Expected Outcomes:

By the end of this activity, teachers will have:

- Defined a specific and measurable goal for a school-based circular economy initiative
- Outlined a clear action plan including roles, timeline, and outreach strategies
- Drafted initial campaign visuals or tools for awareness and engagement
- Prepared to guide students in similar processes during classroom implementation

Step 3 – Brainstorm Campaign Activities (15 minutes)

Teachers generate creative outreach ideas that fit their school context.

Use tools like sticky notes, Jamboard, or Canva Whiteboard.

- *Prompting Questions:*

- How can I make this campaign engaging and visible?
- Can I include students in content creation (e.g., video, posters)?
- What tools or media will be most effective in my context?

* *Sample Ideas:*

- Poster series (e.g., “Sort It Right!”)
- Short videos on Flip or Canva
- Interactive pledge wall
- Circular-themed event (e.g., “Repair Friday” or “No Waste Wednesday”)

Step1– Revisit a Circular Economy Challenge (5 minutes)

Teachers reflect on the issue they identified during Activity 4.1 (e.g. plastic waste in the cafeteria, discarded school supplies).

* *Prompt:* “What exactly do I want to help change in my school context?”

Each teacher articulates one sentence describing a change objective.

Step 4 – Create Draft Materials (15–20 minutes)

Participants begin designing one or more campaign materials. Possible outputs:

- Campaign poster (Canva, Genially)
- Sample social media post or video (Flip, Animaker)
- Visual signage for collection or recycling points
- Draft survey or commitment form (Google Forms)

* Peer feedback is encouraged for refining clarity and appeal.

Step 2–Define the Campaign Goal (10 minutes)

Participants formulate a **SMART goal** (Specific, Measurable, Achievable, Relevant, Time-bound) for their action or campaign.

Examples:

- “Reduce single-use plastics in the staffroom by 50% within one month.”
- “Establish a reuse station with 100+ donated items by the end of term.”

- Use the **Campaign Planning Template** including:

- Campaign Goal
- Target Audience (e.g., students, staff, parents)
- Key Message
- Proposed Activities
- Timeline
- Success Indicators
- Assigned Roles (including who supports implementation)

Step 5 – Finalise the Action Plan (10 minutes)

Each participant finalises their plan using the template and prepares to present it for feedback.

Ensure:

- Timeline is feasible within the school calendar
- Materials are practical and adaptable
- Message is clear, actionable, and linked to the earlier problem mapping

Activity 4.3: Stakeholder Role-Play and Engagement

Objective:

To equip teachers with the skills to identify key school stakeholders, anticipate their concerns, and practise presenting circular economy initiatives in a convincing and strategic manner.

Expected Outcomes:

By the end of this activity, teachers will have:

- Mapped relevant stakeholders for a school-based circular economy action
- Developed a concise and targeted stakeholder pitch
- Simulated a realistic stakeholder interaction to refine communication and negotiation skills
- Reflected on feedback to strengthen their action proposal

Step 1 – Identify Key Stakeholders (10 minutes)

Teachers reflect on their selected campaign or action from Activity 4.2.

They then list individuals or groups whose support is critical for success.

Examples:

- School principal or deputy head
- Facilities or cleaning coordinator
- PTA or parent representatives
- Student council
- Local environmental officer or municipality contact
- Colleagues involved in science, arts, or technology

Prompting Questions:

- Who is directly or indirectly affected by this initiative?
- Who controls the resources (space, time, materials) I need?
- Who might resist or be hesitant – and why?

Step 2– Prepare a Stakeholder Pitch (15 minutes)

Each participant selects one stakeholder group and drafts a short, clear **2–3-minute pitch** addressing:

- The problem and its relevance
- The proposed circular economy solution
- The expected impact on the school or wider community
- The specific support or permission being requested

Optional formats:

- Slide or poster
- Brief spoken pitch
- Flip video
- Role-play notes with speaking points

Step 3 – Simulate the Stakeholder Meeting (15–20 minutes)

Teachers work in pairs or small groups.

- One teacher presents their pitch
- The others take on stakeholder roles and respond with realistic questions or concerns

Examples:

- o “Is this sustainable over time?”
- o “What’s the cost or required maintenance?”
- o “How will you involve other staff or students?”
- o “Have you considered health/safety or regulations?”

**Tip:* Use a timer and encourage honest, constructive responses.

Step 4 – Reflect and Revise (10 minutes)

After each simulation:

- The “stakeholders” provide structured feedback using these three guiding prompts:
 1. What part of the pitch was most convincing?
 2. What part needs clarification?
 3. Was the support request realistic?
- Presenters take notes and revise their plans or messaging as needed.

Activity 4.4 – Take Action & Document the Impact

Objective:

To support teachers in implementing their planned circular economy action or campaign within their school context and reflecting on its outcomes, challenges, and overall impact.

Expected Outcomes:

By the end of this activity, teachers will have:

- Implemented their planned circular economy campaign or action
- Collected documentation and feedback from the school environment
- Reflected on the implementation process and its effects
- Organised materials to share their outcomes with others

Step 3 – Collect Feedback & Monitor Results (10–20 minutes)

Teachers gather feedback and basic data to assess the campaign's reach and impact.

Suggested Tools:

- Google Forms or printed surveys
- Mentimeter for real-time polling
- Padlet walls for open comments

Feedback Prompts:

- What stood out in the campaign?
- What could be improved?
- Did this activity shift thinking about sustainability?
-)

1– Final Preparation (10–15 minutes)

Participants revisit and finalise their action materials and timeline.

Checklist:

- Are all posters, forms, or digital tools ready to use?
- Are all roles clearly assigned and understood?
- Has the school audience (staff, students, others) been informed in advance?

* *Tip:* Teachers may prepare a "Campaign Day Checklist" that includes:

- Setup logistics
- Photo/video capture
- Peer or student observation
- Debrief and clean-up

Step 4 – Reflect on the Process (15–20 minutes)

Participants reflect individually and collectively, using guided prompts:

Reflection Questions:

- What worked particularly well?
- What obstacles or unexpected challenges occurred?
- What did this experience teach me about planning and leadership?
- Did I observe any noticeable change in awareness or behaviour?
- What would I adjust or improve next time?

Suggested Formats for Reflection:

- Google Doc journal entry
- Short Flip video diary
- Illustrated photo story or infographic poster

Step 2– Implement the Action or Campaign (variable duration)

Teachers carry out their planned campaign in their own school setting over a period of 1–2 weeks.

Example Campaign Types:

- Organising a "Zero-Waste Week" in staff rooms or classrooms
- Running a uniform or material reuse station
- Hosting a poster or student-led video exhibition
- Collecting pledges or survey data from colleagues or students
- Installing a sorting bin station with clear visual signage

Documentation tools:

- Before/after photos
- Short video interviews (e.g., with students or colleagues)
- Daily logs or visual diaries
- QR codes or Flip video reflections

Step 5 – Prepare Summary Materials (Optional, 10–15 minutes)

Teachers consolidate evidence and reflections to communicate outcomes.

Output Options:

- One-slide impact summary (e.g., Canva or Google Slides)
- Infographic showing key data and photos
- Short video compilation or blog post
- School newsletter article or display board summary

Activity 4.5 – Circular Change Agent Showcase

Objective:

To support teachers in organising a showcase event where students present the outcomes of their circular economy projects to the school community.

Outcome for Teachers:

Teachers will:

- Guide students in preparing final presentation materials
- Organise a showcase event suited to their school context
- Facilitate community involvement and feedback collection
- Reflect on how to scale or sustain future student-led actions

Step 3 – Feedback & Celebration (15–20 minutes)

Provide a way for the audience to give short feedback:

- Comment cards
- Dot voting (e.g. “Most Creative”, “Biggest Impact”)
- Padlet wall or digital applause tools like Mentimeter

Distribute **Circular Change Agent Certificates** to participating students or teams. You can personalise them with:

- Student’s name
- Name of their project
- Dates of implementation
- A thank-you statement

Step1 – Teacher Facilitation andPlanning

- Decide on the format and logistics of the event
 - Guide students in selecting or creating final showcase products
 - Prepare the space, materials, or digital platforms needed
- Phase 2 – Student Participation and Presentation
**In this part, use “students” wording intentionally: “Students will...”*
- Present their circular economy projects
 - Share reflections and results
 - Receive feedback and recognition

Step 4 – Reflect on What Comes Next (10–15 minutes)

In groups or as a class, discuss:

- What project would you continue or expand if you had more time?
- How can we keep the impact going next semester?
- What advice would you give to the next group of students?

Step 2 – Student Participation and Presentation

In this phase, students actively take part in the event. They will:

- Present their circular economy projects
- Share reflections and results
- Receive feedback and recognition