



Citizen Science Protocol for the implementation of zero-waste seaweed coatings for cosmetics

Workshop-based citizen engagement methodology for plastic reduction in cosmetics

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1. INTRODUCTION

Discover how innovative seaweed-based coatings are transforming the cosmetics industry by eliminating single-use plastic bottles. Each dissolvable “cosmetic ball” replaces traditional packaging, offering a fully biodegradable, zero-waste alternative that reduces plastic at the source.

This technology supports:

Major plastic waste reduction - tackling over 100 billion single-use units produced globally each year.

Sustainable habits - encouraging individuals, businesses, hospitality, and sports centres to switch to effortless, eco-friendly solutions.

High-impact sectors - perfect for tourism, hotels, gyms, and high-traffic areas where waste is generated the most.

Explore the future of sustainable cosmetics - plastic-free, zero-waste, and powered by nature.

2. OBJECTIVES

The objectives of this citizen science activity are to:

- Raise awareness about plastic waste generated by cosmetic products;
- Introduce zero-waste and circular economy principles applied to cosmetics;
- Enable hands-on participation in the preparation and testing of seaweed-coated cosmetic formulations;
- Encourage sustainable consumption habits through experiential learning;
- Collect feedback, baseline knowledge, and post-workshop insights from participants;
- Support structured reporting of citizen engagement activities within the REMEDIES framework.

3. TARGET GROUP

This activity is suitable for:

- General public and local communities;
- Students (secondary and higher education);
- Tourism, hospitality, and sports centre staff;
- NGOs, educators, and sustainability practitioners;
- Participants of public engagement events, festivals, or workshops.

Participation can be adapted to different group sizes, age categories, and event formats.

4. METHODOLOGICAL FRAMEWORK - WORKSHOP STRUCTURE

The workshop is organised into four main phases, following a structured citizen science engagement pathway: **awareness** → **experimentation** → **reflection** → **reporting**.

4.1 PART 1 - Building awareness and collection of the baseline knowledge and interest of the participants

Purpose: To introduce zero-waste concepts, assess participants' existing knowledge, and create an interactive learning environment.

Activities include:

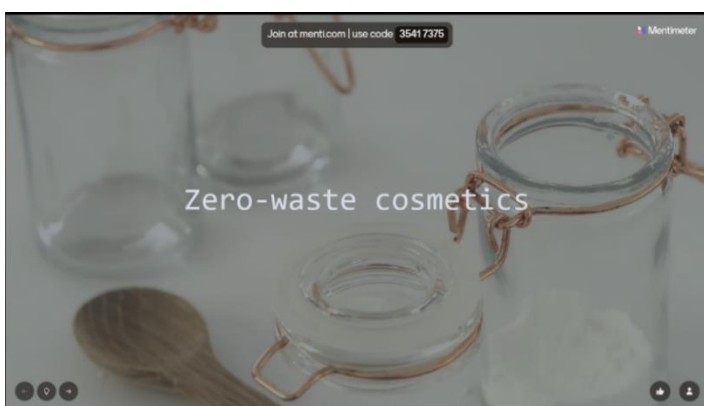
- Introduction to zero-waste philosophy and circular economy principles;
- Interactive word cloud activity (“What does zero-waste mean to you?”);
- Short quizzes on cosmetic formulations (e.g. water content in shampoos);
- Explanation of key cosmetic ingredients (surfactants, glycerol);
- Discussion on environmental and skin impacts of cosmetic ingredients.

Tools used:

- Mentimeter or equivalent interactive survey platform;
- QR codes for anonymous participation;
- Visual slides and ingredient illustrations.

The awareness and introductory phase of the workshop could be supported by visual presentation materials (slides). Below illustrative examples are available, which serve as an example of how zero-waste concepts and cosmetic-related knowledge can be communicated to participants. The included slides represent example content used during the previous workshops and may be adapted to different audiences, event formats, or local contexts.

Slide 1 – Title Slide



“Hello everyone, and welcome to today’s workshop titled **Zero-Waste Cosmetics**.

Today, we’ll explore how cosmetic products can be designed, used, and reimagined in a more sustainable way - with minimal waste and packaging.

This session will be interactive, so I encourage you to take part in the activities throughout.”

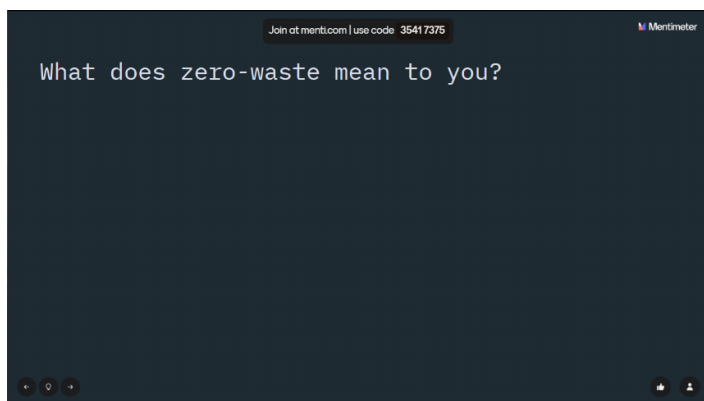
Slide 2 – Instructions / QR Code



“Before we begin, please take your phone or laptop and scan the QR code on the screen. This will take you to our Mentimeter page, where you’ll be able to vote, answer questions, and share your thoughts during the workshop. Don’t worry - all responses are anonymous. The goal is simply to collect everyone’s ideas and start a good discussion.”

(pause to allow everyone to connect)

Slide 3 – What does zero-waste mean to you?

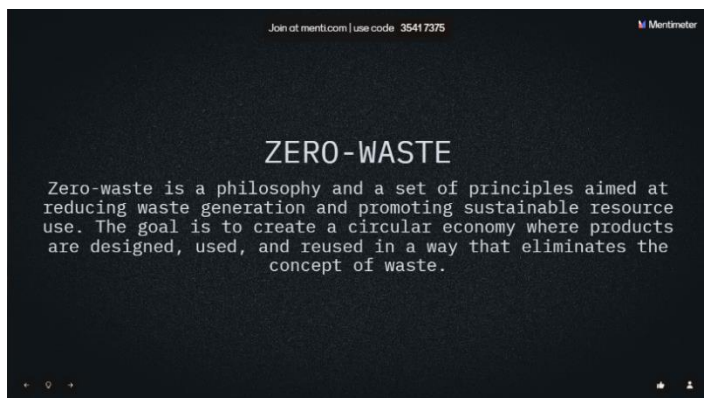


“To start off, let’s see what zero-waste means to you personally. Type in the first few words that come to mind. As you do, your answers will appear in the word cloud on the screen — the more often a word appears, the bigger it gets.”

(after responses appear)

“Great! I see words like no packaging, recycling, sustainability, less waste - these are exactly the core ideas behind zero-waste thinking. Let’s build on these together.”

Slide 4 – Definition of Zero-Waste

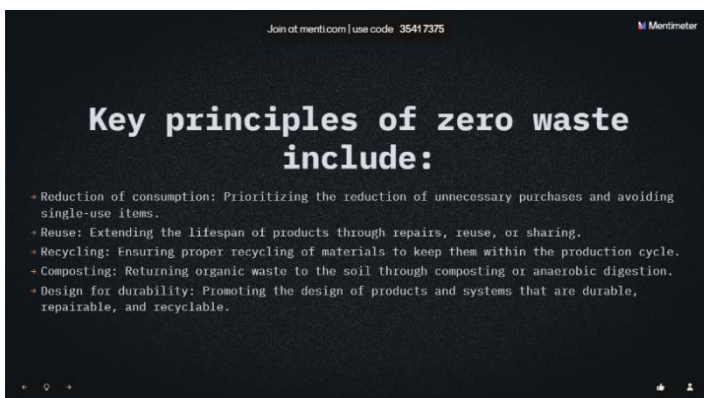


“So, what exactly is zero-waste? It’s not just a trend, but a philosophy - a set of principles aimed at reducing waste generation and promoting the sustainable use of resources.

The goal is to create a circular economy, where products are designed, used, and reused in a way that eliminates the very concept of waste.

It’s about changing how we think - from disposable to reusable, from linear to circular.”

Slide 5 – Key Principles of Zero-Waste



“The zero-waste approach is built on a few key principles:

Reduce consumption: Buy less and avoid unnecessary single-use products.

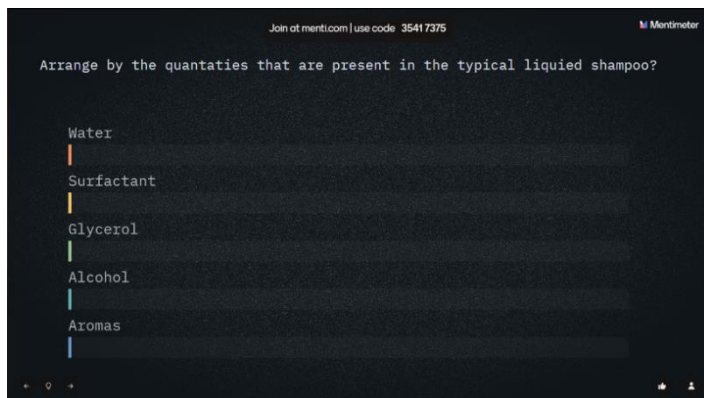
Reuse: Extend the life of products through repairing, reusing, or sharing. Recycle:

Ensure proper recycling of materials to keep them in the production loop. Compost:

Return organic waste to the earth through composting or digestion. Redesign:

Encourage the design of durable, repairable, and recyclable products and systems. We’ll see how these ideas apply to cosmetics in just a moment.”

Slide 6 – Which ingredient is most common in shampoos?



“Let’s make things more concrete - let’s talk about shampoos!

Here’s a quick quiz: Which component do you think is most present in shampoo?

Is it distilled water, glycerol, surfactant, alcohol, or fragrance?

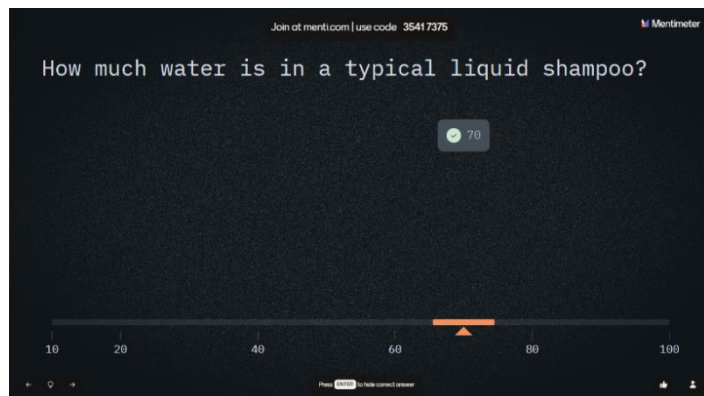
Make your selection on your device.”

(pause for voting)

“I can see that most of you chose distilled water - and that’s absolutely correct!

Let’s take a closer look at why that matters.”

Slide 7 – How much water is in a regular shampoo?



“Next question — how much water do you think a typical liquid shampoo contains?

Enter your guess as a percentage.”

(pause for results)

“The correct answer is around 70% - more than half of a regular shampoo bottle is simply water!

That means more plastic packaging, heavier transport, and more energy used in production.

This is one of the main reasons why zero-waste cosmetics promote solid, concentrated forms - they eliminate unnecessary water from the formulation.”

Slide 8 – Surfactant

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Surfactant

- Cleaning: Helps keep surfaces clean.
- Emulsification: The ability to create homogeneous mixtures between liquids that normally do not mix (e.g., water and oil) by changing surface tension.
- Foaming: The entrapment of small air bubbles or other gases in a small amount of liquid by changing its surface tension.
- Reduces the surface tension of cosmetic products and helps the product spread evenly during application.

“Now, let’s look at one of the key ingredients: the surfactant.

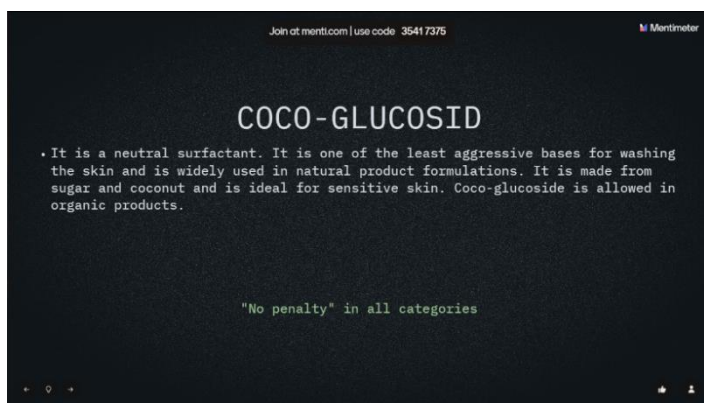
Surfactants are surface-active agents that make cleaning possible.

They help mix water and oil, create foam, and remove dirt and grease.

Without surfactants, shampoo wouldn’t lather or cleanse properly - but some of them can be quite harsh on the skin and the environment.

So, choosing the right one is crucial.”

Slide 9 – Coco-Glucoside



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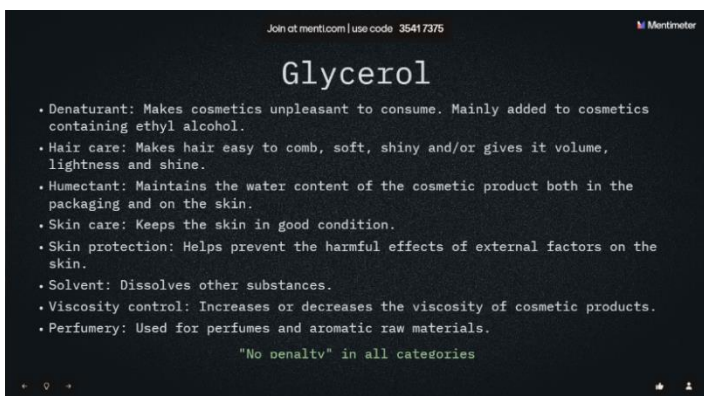
COCO-GLUCOSID

- It is a neutral surfactant. It is one of the least aggressive bases for washing the skin and is widely used in natural product formulations. It is made from sugar and coconut and is ideal for sensitive skin. Coco-glucoside is allowed in organic products.

"No penalty" in all categories

“One of the gentlest surfactants is Coco-Glucoside. It’s a natural, plant-based surfactant made from sugar and coconut. It’s very mild, making it ideal for sensitive skin, and it’s also approved for use in certified organic cosmetics. So, when you’re reading ingredient labels, this is one of the names you want to look for!”

Slide 10 – Glycerol



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Glycerol

- Denaturant: Makes cosmetics unpleasant to consume. Mainly added to cosmetics containing ethyl alcohol.
- Hair care: Makes hair easy to comb, soft, shiny and/or gives it volume, lightness and shine.
- Humectant: Maintains the water content of the cosmetic product both in the packaging and on the skin.
- Skin care: Keeps the skin in good condition.
- Skin protection: Helps prevent the harmful effects of external factors on the skin.
- Solvent: Dissolves other substances.
- Viscosity control: Increases or decreases the viscosity of cosmetic products.
- Perfumery: Used for perfumes and aromatic raw materials.

"No penalty" in all categories

“ Another common ingredient is Glycerol, or glycerin. It serves several purposes - it acts as a humectant that retains moisture in both the skin and the product, helps protect the skin from environmental stress, and makes hair soft, shiny, and easy to comb. It also helps maintain the right consistency of the cosmetic product. In zero-waste cosmetics, we prefer using plant-based glycerine rather than synthetic versions.”

End of Part I



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Survey about zero-waste cosmetics

“So, that wraps up the first part of our workshop. Invitation for participants to participate in survey about zero-waste cosmetics (example of the survey - share our link) You now understand the key principles of zero-waste and how they relate to cosmetic formulations. In the next section, we’ll move into practice - creating simple, sustainable cosmetic products and seeing how small changes in formulation can make a big environmental difference.”

4.2 PART 2 - Hands-on Workshop: Zero-Waste Cosmetic Preparation

Purpose: To actively involve participants in the preparation and demonstration of zero-waste cosmetic solutions using seaweed-based coatings.

Activities include:

- Demonstration of seaweed-based coating technology;
- Step-by-step preparation of cosmetic balls (shampoo or shower gel);
- Explanation of material selection and sustainability benefits;
- Optional participant involvement depending on safety and event conditions.

Invitation to scan or share the slides on the monitor for participants to follow the steps. There are three variations of the demonstration that can be tailored for the event type or other requirements.



Figure 1: QR codes with the link to the guidelines for step-by-step production of zero-waste seaweed coating cosmetics.

4.3 PART 3 - Harvesting of the results

Purpose: To capture learning outcomes, behavioural reflections, and user experience feedback.

Data collected may include:

- Participant feedback on zero-waste awareness;
- Perceived usability of cosmetic balls;
- Willingness to adopt zero-waste cosmetics in daily life;
- Suggestions for improvement or further development.

Tools used:

- Post-workshop surveys accessed via QR code;
- Optional at-home testing surveys for product use in real-life settings.

Workshop concluding remarks example:

“Thank you for joining our zero-waste cosmetics workshop series. You’ve learned how to reduce waste, reuse ingredients, and design sustainable routines. We hope you leave inspired to apply these practices at home, share the knowledge with others, and continue exploring innovative, eco-friendly cosmetic solutions.

You are further invited to co-create methodology via provide feedback on the workshop they participated.”

QR codes to surveys for providing participant feedback:

The following QR codes support the harvesting of learning outcomes and behavioural insights, enabling participants to reflect on their journey from awareness to practical application of zero-waste solutions.

Post-Workshop Reflection Survey:

Participants are invited to complete a short survey reflecting on their knowledge, perceptions, and attitudes towards zero-waste cosmetics after the workshop. The survey builds on the previously answered baseline questions, allowing comparison between initial understanding and post-workshop learning outcomes.



Figure 2: QR code for participants after the workshop.

Zero-Waste Cosmetics Testing & Feedback Survey:

As a final step, participants are encouraged to test the produced zero-waste shampoo or shower gel balls in an environment of their own choosing (e.g. home, gym, travel). Through this survey, participants share their user experience, usability feedback, and reflections on adopting zero-waste cosmetics in daily routines.

This step supports the transition from educated to engaged and ultimately conscious plastic-free or zero-waste individuals, completing the innovation and behavioural change pathway.



Figure 3: QR code to zero-waste cosmetics with seaweed coating product testing survey.

4.4 PART 4 - Workshop impact reporting to REMEDIES dashboard by the workshop facilitator

Purpose: To ensure harmonised reporting of citizen science activities within the REMEDIES project.

After the workshop, organisers are encouraged to:

- Report the event through the REMEDIES dashboard;
- Upload basic metadata (date, location, number of participants);
- Indicate the type of activity (workshop, demonstration, citizen engagement);
- Link survey results where applicable;
- Promote zero-waste cosmetic practices through social media or newsletters.



Figure 4: QR code with the link to survey to report the workshops or event to REMEDIES dashboard.

5. ETHICS, DATA PROTECTION, and GDPR

All data collected during the workshop should be handled in accordance with GDPR principles, including:

- Voluntary participation and informed consent;
- Anonymised survey responses;
- Transparent communication about data use;
- Responsible use of photographs and documentation materials.

Participants should be informed in advance about data collection and reporting practices.

Additional Materials available on: <https://remedies-for-ocean.eu/citizen-science-demonstration-protocol-for-the-preparation-of-zero-waste-seaweed-coatings-for-cosmetics/>

This protocol was developed within the framework of the REMEDIES project and contributes to the EU Mission “Restore Our Ocean and Waters”.

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