YOUTH ENERGY LABS

Co-funded by the European Union

"YOUTH ENERGY LABS" GUIDE FOR YOUTH AND YOUTH WORKERS

Youth Energy Labs

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About the project

Youth Energy Labs (YEL) is a project dedicated to advancing **environmental sustainability** throughout the European Union by providing comprehensive training in renewable energy, circular economy practices, self-consumption, and sustainable entrepreneurship.

YEL aims to **equip** youth workers, youth, and their families **with the knowledge and skills** necessary to embrace sustainable consumption models within their communities. By offering targeted training modules, participants will gain valuable insights into **eco-friendly practices and contribute to meaningful environmental change**.

The project will establish "Energy Labs" in Spain, Greece, Latvia, and Italy, serving as pilot locations for sustainable initiatives before expanding across other EU member states. Additionally, an Awareness Campaign will be launched to raise awareness of the **importance of sustainability in combating climate change**.

Aligned with the principles of common values, engagement, and civic participation, YEL recognises the pivotal role of education and hands-on experience in fostering environmental stewardship. Special emphasis will be placed on **reaching young people** facing energy poverty or social vulnerability, empowering them to lead sustainable initiatives in their communities.

Furthermore, the project seeks to **promote active citizenship and youth entrepreneurship** by providing young beneficiaries with entrepreneurial skills through the creation of their own energy laboratories and sustainable initiatives.

Through collaborative efforts, YEL is poised to make a significant **impact on environmental sustainability** within the EU, nurturing a generation of young leaders committed to **building a greener and more sustainable future**.

The Youth Energy Labs project is funded by the European Union within the framework of the Erasmus+ programme.

Aim of the guide

The aim of the Guide is **to provide simple steps to be followed to create an energy lab** on the topics related to **renewable energy, circular economy practices, self-consumption, and sustainable entrepreneurship**. Based on the research carried out during the initial phase of the project, the target group for such Energy Labs are young people between the ages of 16 and 30 in a situation or at risk of social exclusion due to economic issues and/or in a situation or at risk of energy poverty.

The Guide is primarily intended for youth workers **to help them set up Energy Labs and organise activities for young people** with the aim to develop their knowledge, skills and competences. Through the creation of Energy Labs and implementation of the activities, the youth workers will seek to:

- equip young people with the knowledge and practical skills needed to understand and address environmental issues; this includes **technical skills** related to renewable energy and entrepreneurship, as well as **soft skills** like critical thinking and problem-solving;
- encourage creative thinking and problem-solving by facilitating **hands-on projects and activities** that explore circular economy, renewable energy, green entrepreneurship, and sustainability;
- **build networks** among youth, educators, and local stakeholders to share ideas and resources, enhancing community involvement;
- **raise awareness** about energy consumption, sustainability, and climate change issues, encouraging informed decision-making;
- **develop leadership and teamwork skills** in young participants through collaborative projects and initiatives.

In addition, this guide will be a technical resource for young people to follow sequenced steps to create these spaces in their own contexts, promoting more sustainable and less polluting consumption and energy models.

Short introduction to Energy Labs

An energy lab typically refers to a programme or initiative that engages youth in **hands-on learning, innovation, and activism** related to renewable energy technologies, sustainability, circular economy, self-consumption, and sustainable entrepreneurship. Such labs often serve as spaces, both on site and online, where youth can learn more about the topics mentioned before, acquire new skills, and engage in practical activities to **develop solutions to energy and sustainability challenges**.

There are several key parts of the Energy Labs.

1 Education and training

These labs offer knowledge to develop skills in science, technology, engineering, and maths, the so-called STEM skills which are widely demanded by employers due to changes in technological advances. Some of the most important STEM skills to be developed during Energy Labs are: **problem-solving, creative thinking, communication, collaboration, intellectual curiosity, flexibility, and data-driven decision making**. Participants might learn how to use hydropower to lift objects, how the colour of a house might reduce energy footprint, how wind power generates energy – these are some of the sample activities provided in the second part of this guide. In addition, participants will also acquire **knowledge on sustainability, sustainable development goals, consumption, circular economy, and entrepreneurship** which will provide a comprehensive framework on sustainability and will, in turn, help in the following stages of Energy Labs.

2 Innovation and problem-solving

Youth are encouraged to take active participation in initiatives and to use the skills acquired during the education and training part **to try to solve real-world energy problems**. This can be achieved through projects, competitions, or research initiatives developed and offered in the Energy Labs. The sample activities provided in the second part of the guide can be used to give knowledge and change the mindset of youth so they are empowered and willing to make innovations and solve problems.

3 Community impact

The Energy Labs are meant not only to provide knowledge but also to have **a tangible impact on the communities**. As a result of these Energy Labs, the young beneficiaries themselves, with the support of youth workers, will create their own Energy Labs and sustainable initiatives based on the use of clean energy and circular economy, thus promoting their entrepreneurial skills. The young beneficiaries of the project will thus **become active agents of change**, being able to develop their own circular economy initiatives, or the development of clean energy in the laboratories, thanks to the training acquired.

4 Leadership and advocacy

The energy labs will also help guide young people **to implement new initiatives at schools and community level**, sharing time and space with other young people and professionals. The goal of the energy labs is to give young people the tools and skills to drive change in energy systems worldwide.

To sum up, Energy Labs are about **combining learning and training, innovation, and community action** through participatory approaches to inspire young people to be active actors in the transition towards a more sustainable future. The Energy Labs provide a safe and creative space for channelling the ideas of young people to address the pressing challenges in the field of sustainability.

Participatory approaches

One of the aims of Energy Labs is to **promote active involvement of young people and various stakeholders in initiatives related to community development and sustainability**. It is important to ensure that the young people are not merely passive observers but active participants in decision-making in the fields of climate change and sustainable development. To do this, it is necessary to create a participatory environment where young people feel that they are being heard and valued, and that they can take action and implement their ideas.

The embedding of participatory approaches took place in the initial phase of the Youth Energy Labs project when research on the training needs related to a change of energy and consumption model was carried out, resulting in the **Report on the Training Needs of Youth Workers in the Field of Renewable Energy Use, Circular Economy, Consumption Patterns and Sustainable Entrepreneurship**. It was done through the application of semi-structured interviews and surveys addressed to youth workers and experts on renewable energies and circular economy. The participatory approach will also be applied when creating Energy Labs and developing educational resources and initiatives intended for young people, thus ensuring that the project remains focused on its core objective: "**to promote the use of renewable energies and circular economy in the European Union, through the development of a methodology and training resources aimed at young people in vulnerable situations and youth workers working with them, as well as through the creation of youth initiatives based on sustainable and non-polluting consumption models**".

The participatory approach will be implemented through the action-research methodology which is specifically tailored to engage young people to take an active role in promoting clean energy and circular economy within the scope of Energy Labs where they can acquire knowledge, implement their ideas, assess ongoing projects, and influence outcomes that affect their communities. The goal is to **empower young people** with tools and opportunities to engage with the abovementioned issues and **to become active agents of positive change**.

Importance of participatory approach

Over the last decades, participation has become important in the field of sustainability. The European Environment Agency emphasises that "sustainability transitions require shifts in production and consumption systems that will impact our whole way of life. A transition that considers questions of distributive and procedural justice is a challenge that calls for the full creative potential and involvement of all sectors of society, including citizens", and we believe that young people as future leaders is one of the most important target groups to be involved in such a transition towards a more sustainable future. It further states that "public participation can unleash creativity, generate knowledge and mobilise agency", and that is what is intended to be achieved in Energy Labs.

Participation increases efficiency and sustainability, it **leads to empowerment**, it enhances the achievement of development goals, and therefore it is essential in the transition towards a more sustainable future. Participatory methodology has been used in various fields, and it has become widespread also when working with young people. Although initially such methodology was applied to research, it is also relevant when creating Energy Labs and empowering young people. This methodology represents a **transformative approach to research that prioritises the needs, knowledge, and involvement of participants**, and it can and should be applied also to Energy Labs.

By fostering inclusivity, collaboration, and empowerment, this methodology helps to create a safe space for young people to express their ideas, learn new skills, look for new and innovative solutions to contribute to the promotion of clean energy, circular economy, responsible consumption, and sustainable entrepreneurship which will not only help fight the climate change but will also lead to meaningful social changes in terms of behaviour and attitudes.

It is important to note that the participatory methods are still being researched, improved, and applied to different fields, so the role of this methodology or approach in dealing with climate change and sustainability is still relatively new. Nonetheless, it is relevant for Energy Labs.

Action-research methodology

Action research emerged as a distinct methodology in the mid-20th century, and it was developed by Kurt Lewin, a social psychologist. Lewin created this concept to bridge the gap between theory and practice. He believed that research can be truly impactful if it is participatory and involves the people who are affected by the particular research. It is important to note that also this methodology was initially applied to research only but it laid the groundwork for subsequent developments in action research across education, healthcare, community development, and organisational change.

Over the last decades, this methodology has evolved, incorporating insights from different disciplines and adapting to different contexts; it involves a cyclical process of planning, action, observation, and reflection. Nowadays, this methodology is recognised as **useful for addressing real-world problems through collaboration**, and because of this it is useful for Energy Labs. However, it should be emphasised that the cyclical process mentioned before is a model that can be followed when creating Energy Labs, but that does not mean that there cannot be any deviations from such a model. It is important to understand that these models offer guidance rather than specific rules to follow.

Action research is particularly **effective in youth engagement**, providing young people with a space (for example, energy lab) for learning new knowledge and actively participating in the promotion of sustainability, i.e. renewable energy, circular economy, responsible consumption, and sustainable entrepreneurship. By being involved in youth Energy Labs and by creating their own Energy Labs or initiatives, young people will develop useful skills such as critical thinking, problem-solving, and leadership skills. This, in turn, can help address issues related to sustainability and strengthen the capacity of young people to contribute to their communities in the long term.

Action-research for engaging young people in sustainability issues

Action research offers a theoretical basis for creating Energy Labs, dividing the whole process in six important phases which are explained in more detail below.

1 Identifying the problem

The objective is to **collaborate with young people** to find out specific climate and sustainability issues which are important to them. There are several steps that should be taken:

a. community assessment – organise workshops or surveys to obtain information from young people on the issues or problems in their communities in relation to climate change and sustainability;
b. stakeholder mapping – identify the relevant stakeholders, e.g. environmental organisations, experts, who can provide additional perspectives and knowledge;
c. problem definition – work with the young people to define the problem, for example, the application of the linear economy principle in the community.

2 Planning

The objective is to **develop a specific and strategic plan** for addressing the problem. There are several steps that should be taken:

a. goal setting – facilitate discussions to establish measurable goals for addressing the problem;
b. strategy development – collaborate with young people to find possible solutions or actions to address the identified problem;
c. resource identification – determine what resources are needed to implement the chosen strategies;
d. timeline creation – develop a timeline outlining milestones and deadlines.

3 Action

The objective is to **implement the identified actions** to address the problem. There are several steps to be taken:

a. mobilisation – engage the young people in executing the planned strategies, e.g. identify the linear economy examples in the community which can be improved;
b. partnerships – establish partnerships with experts to facilitate the addressing of the problem;
c. capacity building – provide training and resources to young people to improve their skills in knowledge in the respective fields, e.g. linear vs circular economy.

4 Observation

The objective is to **monitor and document the progress** and impact of the actions taken. There are several steps to be taken:

a. data collection – use surveys, interviews, observations to gather data on the outcomes of the actions taken, e.g. increased awareness of circular economy, changes in behaviour, new good practices, etc.;
b. progress tracking – review the progress according to the set goals and guidelines;
c. stakeholder feedback – gather feedback from the participants and experts to make sure the Energy Labs are effective and achieve the set goals.

5 Reflection

The objective is to analyse the results of the actions taken and to **reflect on the operation of the energy lab**. There are several steps to be taken:

a. data analysis – analyse the data collected during the observation phase to ascertain whether the energy lab goals have been met;
b. lessons learned – implement reflection sessions with the participants and stakeholders to discuss the energy lab, what worked, what should be improved, etc.;
c. document findings – compile the findings and conclusion in a report or presentation that can be shared with the community or other stakeholders interested in creating their own Energy Labs.

6 Revised planning

The objective is to **improve the operation of the Energy Lab** based on reflection and analysis. There are several steps to be taken:

a. adjust strategies – take into consideration the data and feedback collected to adjust the initial plan of the energy labs;
b. plan for next cycle – outline the next phase of energy labs and take into account the data and feedback collected to improve the effectiveness and impact of energy labs;
c. sustainability planning – develop strategies to ensure the sustainability of energy labs, for example, provide opportunities for young people to create their own energy labs.

Activities in Energy Labs

Energy Labs offer a platform and safe space for young people to engage in hands-on projects related to sustainability and acquire new knowledge on these topics. There are several steps to be done to design and implement specific activities within an energy lab.

Defining objectives

1) It is necessary to **set broad goals** for each activity, e.g. promoting renewable energy, fostering circular economy practices. At this stage, the goal will be broad and later in the process several specific objectives will be set according to the youth energy lab activity outline (Pages 23 and 24 of the guide).

2) it is necessary to **identify the target group** – their age and background to tailor objectives that meet their needs and interests. This includes gathering information on their interests, needs, and preferred learning styles. This step can be done by designing and distributing surveys before training, as open questions to the group, or by consultation with schools to create workshops that fit in the school's curriculum.

Needs assessment

1) Conduct surveys (in person or online using, for example, Google Forms) and focus groups to understand local environmental challenges and interests. In the initial stage of the Youth Energy Labs project, we conducted surveys and interviews in the respective countries with the youth workers to find out what their training needs are in relation to a change of energy and consumption model, resulting in the **Report on the Training Needs of Youth Workers in the Field of Renewable Energy Use, Circular Economy, Consumption Patterns and Sustainable Entrepreneurship**. This data was afterwards used in the development of the Youth Energy Labs training module for youth workers.

2) Learn more about the community and location of the Energy Labs to understand local resources, challenges, and opportunities. This can be done by conducting desk research or via online surveys.

3) Use mind mapping or stakeholder matrix techniques to identify potential partners and stakeholders who can support the energy lab or specific activities carried out within the framework of Energy Labs.

4) Assess available resources, community strengths, and potential partnerships.

Curriculum development

1) Develop a curriculum on environmental sustainability, renewable energies, circular economy, responsible and sustainable consumption, and green entrepreneurship. A great resource to use is the **Youth Energy Labs e-course for youth workers** to promote environmental sustainability, renewable energies, circular economy, sustainable consumption models and green entrepreneurship. The e-course consists of five modules which can be acquired as a whole and also separately, and the successful completion of the e-course will allow youth workers to access contents and practical tools to approach and raise awareness among young people about the urgency of acting in favour of environmental sustainability. This e-course contains useful information and resources on all the mentioned topics, and it will form a great basis for a curriculum.

2) Remember to **align the curriculum with national or regional educational standards** to ensure it complements school learning and enhances academic performance. In addition, it is necessary to align the curriculum with the European sustainability competence framework, i.e. the **GreenComp**, which provides a common ground to learners and guidance to educators, providing a consensual definition of what sustainability as a competence entails.

3) It is important to choose the correct approach and methods when organising activities within youth Energy Labs. There are several effective learning methods suited for young people, particularly in engaging contexts like a youth energy lab:

Hands-On Learning
Experiential activities allow youth to learn by doing. Projects like converting kinetic energy into mechanical energy or conducting energy audits make concepts tangible and memorable. We have provided some sample activities in the second part of the guide, e.g. how to use hydropower to lift something, how to generate electricity using wind power, etc. See Activities 5 to 8.

Gamification
Incorporating game-like elements into learning can increase motivation and engagement. This could involve competitions or interactive simulations related to energy challenges, making motion videos on sustainability related concepts. See, for example, Activity 10 on making a stop motion animation movie.

Multimedia Resources
Using videos, podcasts, and interactive online tools can cater to various learning styles, making complex concepts more accessible and engaging. See, for example, Activity 10 on making a stop motion animation movie.

Project-based Learning
Focusing on specific projects allows youth to apply knowledge in practical contexts, making learning relevant and meaningful.

Collaborative Learning
Group projects foster teamwork and communication skills. Peer learning encourages diverse perspectives and problem-solving approaches. This could involve various group works, discussions. See Activities 1 to 4 on environmental sustainability and how group work can enhance the acquisition of knowledge.

Inquiry-based Learning
Encouraging youth to ask questions and explore topics on their own fosters critical thinking. This method helps them develop a deeper understanding of sustainability issues. See, for example, Activity 13 where participants are required to ask questions about the origin of clothing and to foster critical thinking in the field of fashion.

Mentorship and Role Models
Connecting youth with mentors in the energy field can inspire and guide their learning. Real-world experiences shared by professionals can be particularly impactful.

Some pedagogical methodologies that have been proven to work best with youth

Culturally Relevant Pedagogy
Incorporating students' backgrounds and experiences into the curriculum makes learning more relatable and meaningful. This approach fosters inclusivity and engagement.

Scaffolding
Providing support and gradually increasing complexity helps youth build confidence and competence. This could involve breaking down tasks or offering guidance as they work through challenges.

Constructivist Approach
This method emphasises active learning where students construct their own understanding through experiences and interactions. Facilitators can guide discussions and activities that allow youth to explore concepts related to energy.

4) Once you have decided what you want to teach to the youth or which skills you want to help improve, proceed with creating a Youth Energy Lab activity, see the outline (Pages 23 and 24 of the guide). This outline includes the most important things needed to organise a Youth Energy Lab activity, and it offers a clear guidance on the objectives, desired outcomes, and a step-by-step guide to implement a specific activity aimed at improving the skills, competences, and knowledge of young people.

Partnerships and collaborations

Once you have decided on the activity you want to implement and have filled in the activity outline (Pages 23 and 24 of the guide), it is advised to **look at potential partnerships and collaborations** who could help with the implementation of the specific activity. Such partnerships could be formed with local environmental organisations, universities, businesses who have experience in the respective fields, or with experts in sustainability, renewable energy, and entrepreneurship for workshops and mentorship. The involvement of such actors will have a positive impact on youth, improve their engagement in activities, and provide a unique and practical perspective on the topic discussed.

Resource allocation

1) Determine the materials and tools needed to carry out the proposed activity. This includes everything – stationery (pens, pencils, paper, etc.), furniture (tables, chairs, etc.), specific tools, materials, training materials, safety gear, premises, devices (tablets, computers, monitors, projectors, etc.). The list of the materials and tools needed will be different for each activity, but it is important to list everything, even the smallest things as post-it notes.

2) Develop a detailed budget that includes costs for materials, facilitators, venue rental, and other necessary expenses.

3) If necessary and possible, seek funding for the Youth Energy Labs through grants, community sponsorships, or collaborations with businesses.

Facility set-up

1) Choose a location that is accessible for the intended activity. That could include community centres, schools, co-working spaces, outdoor areas, depending on the type of activity you wish to implement. Make sure that the premises are large enough and have all the necessary equipment, or it is possible to bring all the necessary equipment to these premises.

2) Keep in mind that you might organise several activities, so it is advised to choose a location that might be suitable for a variety of activities, such as workshops, DIY classes, discussions, artistic creations, etc.

Recruitment and training

1) Recruit youth participants through your social channels, through outreach in schools, community events, and online platforms.

2) Before implementing Youth Energy Labs activities, it is necessary to train facilitators in sustainability topics (see the E-course), engagement techniques, and, if necessary, pedagogical methods and approaches.

Implementation

Once you have developed the relevant Youth Energy Lab activities, you have secured the premises and all the equipment needed to implement these activities, and you have found the participants, it is time to implement the activity. It is important to make sure that the participants of the activity are informed about the activity, what is expected of them, what they will have to do, and what will be the results of the activity.

- Provide an overview of the activity goals, structure, and expectations. Explain the roles and responsibilities of participants.
- Implement Energy Lab activities using **interactive and experiential teaching methods that engage youth** and cater to various learning styles. Include strategies for group work, conflict resolution and reflection. More information on the pedagogical approaches and methods see in the Section “Curriculum Development”.
- Implement **hands-on projects** that allow participants to apply theoretical knowledge. Ensure that Energy Lab activities are relevant, engaging, and achievable within the available resources. See part 2 of this guide for practical activity examples in various fields – sustainability, circular economy, renewable energy, responsible consumption, and green entrepreneurship.
- Follow the plan of the activities; however, be prepared to adjust the schedule based on participant feedback and learning progress. Alternate between theoretical and practical sessions. Allow for sufficient breaks and reflection periods. This should already be taken into account when developing activities.
- **Encourage participants to collaborate** and learn from each other through group projects and peer review. More information on the pedagogical approaches and methods see in the Section “Curriculum Development”.
- Implement regular check-ins and feedback sessions with participants during the Energy Lab activities to share experiences and challenges. Use feedback to make necessary adjustments to the future Energy Lab activity implementation.

Evaluation and feedback

- Develop metrics to **assess impact**, such as changes in knowledge, skills, and behaviours related to sustainability. This can be done by conducting assessments before and after the activities to measure knowledge gain and skill development. Use a mix of quizzes, practical demonstrations, and self-assessments.
- Gather feedback from participants, parents, and facilitators through surveys, interviews, and focus groups to gain insights into their experiences.
- Analyse assessment data to evaluate the effectiveness of the Youth Energy Lab activities. Look for patterns and trends that indicate strengths and areas for improvement.
- Use evaluation results to make informed changes to the Energy Lab activities content, teaching methods, and structure.

Sustainability and expansion

- Look for possibilities to ensure the energy labs sustainability through partnerships, ongoing funding, and community support.
- Explore opportunities to expand the energy labs to other communities or integrate with local schools.

Outreach and advocacy

- Promote the implemented Youth Energy Labs activities to raise awareness of sustainability issues and youth engagement. Make posts on social media, articles in local newspapers, and use any other channels that might be appropriate to spread the information on Youth Energy Labs.
- Encourage participants to **advocate for sustainability initiatives in their communities and beyond** by posting about the Youth Energy Labs on their social media and inviting their friends to participate in them as well. Encourage participants to try to implement their own Youth Energy Labs to expand their knowledge even further and to gain new leadership skills.

Sample activities

The activity outline includes several sections, and below you can find an explanation what information should be included in each section.

Activity title	The name of the activity
Tackled problem	The issue or challenge the activity addresses, for example, fast fashion waste, circular economy principles, definition of sustainable business ideas
Duration	The total time required in minutes, hours
Key concepts	Core ideas or principles of the activity, e.g. SDG goals, energy conversion, waste prevention
Target group and age	The specific demographic and age range, e.g. pupils, students
Aim and objectives of the activity	Goals and specific objectives, e.g. to convert kinetic energy into mechanical energy, to develop the Business Canva model, to teach basic stop motion animation techniques
Desired outcomes	Competencies covered (knowledge, skills, attitudes), keeping in mind the link to the GreenComp
Group size	Minimum and maximum number of participants
Activity/ workshop	A step-by-step guide on how to implement the activity. This section has three subsections: 1) preparation and briefing, 2) instructions and flow, 3) debriefing. Each of these sections should provide specific instructions on what to do before the activity, what needs to be prepared, how to start the activity, what are the steps of the activity itself, and how to implement the debriefing (reflection). It is important to indicate also the time required for each step, e.g. the presentation of the activity (10 min), dividing participants into groups (5 min), etc.

Materials and hand-outs needed	The list of materials and handouts, with images if applicable. This list should be as exhaustive as possible, indicating in it even the smallest things necessary for implementing the activity, e.g. post-it notes, pencils, paper, tables, chairs, old t-shirts, scissors, etc.
Tips for facilitators	Practical advice for facilitators. Here give suggestions on how to adapt the activity to 1) smaller/larger groups, 2) shorter/longer duration, and 3) smaller/larger and temporary/permanent spaces
Suggestions for follow-up	Recommendations for extending learning, e.g. a study visit to a local hydropower facility, an exhibition of the things made during the workshop, keeping journals for reflection
Ideas for action	Application of the knowledge in real life, e.g. make content on social media to raise awareness, collaborate with local organisations to create a campaign on sustainability
Other appendices	Additional materials or information
Useful resources	Additional resources

This guide includes **20 practical activities** that can be implemented in Youth Energy Labs, and each activity is structured to provide detailed guidance for facilitators, starting from the objective of the activity, the materials needed, and the precise instructions for carrying out the activity, and ending with follow-up activities, ideas for action, and any other useful resources.
To select the most appropriate activity for a particular objective or context, we recommend to look at the following sections first:

- Title of the activity;
- Tackled problem;
- Duration;
- Target group.

The information in these sections will provide you with the most important information to determine if the activity is appropriate and useful for you.

In developing this guide, we have prepared **20 sample activities** that are divided in five topics:

Activities 1–4	environmental sustainability
Activities 5–8	renewable energy
Activities 9–12	circular economy
Activities 13–16	responsible and sustainable consumption
Activities 17–20	green entrepreneurship

These activities cover a wide range of topics; some of them are more advanced and intended for young adults, whereas others are also suitable for younger participants. Some of the activities involve discussions and teamwork, whereas others are more practical and aimed at creating something new.

Our **goal was to offer a variety of activities that will support the knowledge gained by youth workers** in the e-course, thus helping the youth workers to convey this knowledge to youth participants and subsequently raise their awareness of the topics covered in the e-course and encourage them to be more active participants in the field of sustainability.

YOUTH ENERGY LABS

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ACTIVITIES

ENVIRONMENTAL SUSTAINABILITY

1

Walk and Talk

any age

1.5 hours

Tackled problem: Environmental awareness and knowledge on climate change.

Key concepts	• Discussion • Communication skills • Environmental awareness • Personal experience
Aim and objectives	The aim of this activity is to learn about environmental awareness and climate change in an informal setting. **Objectives:** 1. to contribute to healthy living, movement, and being in nature, or outside in general; 2. to promote discussion and exchange of opinions among the participants; 3. to gain new insights on environmental awareness; 4. to see how each of us might have a different perspective on the same topic.
Group size	10 to 40 participants

Desired Outcomes

- The participants have gained new knowledge on environmental awareness and climate change, they have understood that everyone might have a different opinion on various topics, and not only opinion but also different experiences and memories.
- The participants have improved their communication and discussion skills.

Materials and hand-outs needed

The facilitator has to prepare:
- the route of the walk – it could be a map of the area where the spots for changing pairs are marked;
- questions printed on a piece of paper.

Activity

Preparation and briefing

- To prepare for this activity, prepare questions about environmental awareness and climate change (the number of questions depends on the number of participants). Some question examples (depending on the age of the participants) could be:
  a. What does environmental awareness mean to you?
  b. What is climate change and what are its causes?
  c. How has climate change affected you personally?
  d. Does climate change affect your mental health? If yes, how?
  e. Are humans responsible for climate change? Why or why not?
  f. How do you protect the environment?
  g. Do you think that recycling is effective? Why or why not?
  h. What is the most important environmental issue facing our planet right now?
  i. What are some ways to reduce plastic waste?
  j. How can we encourage people to be more environmentally conscious?
  k. What do you think the world should do to stop climate change?

- Print out the questions on a piece of paper. (Alternatively – on the phone)

- Since this activity is done while taking a walk, before the activity create a specific route. The length and location of the route is decided by the facilitator depending on the number of participants, their age, and where they are located. It could be a walk in a nature park, if one is nearby, or a walk around the city. In this case the facilitator should choose areas and streets where there is not too much traffic so the participants can talk freely and be able to hear others.
- Once every 5 to 10 minutes (or depending on the complexity of questions) there should be a spot where the participants change pairs and get the next question to discuss.

Instructions and flow

- Everyone meets outside at the designated spot (or alternatively they meet in a classroom or any other setting and then go outside together).
- Once all the participants have gathered outside, the facilitator explains this activity – the discussions will take place in pairs, each pair will have one question to discuss while they are walking from one place to another. Once they arrive at the second, third, fourth, etc. spot, they change pairs and get a new question to discuss. They do so until all of the participants have had the possibility to discuss several questions with different people. It would be advisable to discuss one of the questions with at least two different people to see if there are any differences of ideas, beliefs.
- While the students are walking and talking, the facilitator moves around and joins different pairs to observe their discussions, their ways of thinking. If necessary, the facilitator might help the participants who struggle to discuss certain topics by asking additional questions, by pointing out some interesting ideas, concepts, beliefs, and so on. The facilitator observes the pairs to prepare for the debriefing part.

Debriefing

At the end of the activity, all the participants gather at the final spot to reflect on their discussions. The facilitator asks the questions to all of them and asks:

- to share their answers,
- what did they learn from others,
- was there something new they learned,
- what are their thoughts on the topics discussed,
- is there anything they could not agree on in pairs,
- where there any topics on which your thoughts were categorically different;
- are there any topics that required more time to discuss them;
- what are the topics that should be talked about in future?

These are only samples of questions, and the questions will largely depend on what the facilitator observed during the activity.
These answers could be used to improve the questions for future activities, or can be followed by creative workshops to discuss the matters in more detail (in another day, sometime in future).

Tips for facilitators

Tips for facilitators:

- for smaller/larger groups – larger groups might have to have more than 4 questions prepared;
- duration – if you want the activity to last longer, you should prepare more questions and make a longer route, but if you want the activity to last a shorter period of time, you should prepare less questions and a shorter route;
- this activity is mainly intended to be performed outside, but it can also be done in a building where there is the possibility to walk around. However, we would suggest doing it in an open space so the participants feel more open and more ready to share their beliefs and thoughts.

Suggestions for follow-up

The activity can be used as a basis for other activities, for example, the participants could be asked to write a report on this activity and their experience, or make a creative video about it. This activity can also be used before creative workshops where the participants have to put their ideas on posters which can then be put on the walls in their organisation, school, or any other setting.

Ideas for action

- Participants could implement this activity in their country, school, involve this community and find out their opinions on various things.
- Participants could create educational videos – ask these questions to people (of various ages) they meet on the street and film their responses. This could lead to understanding how people of different ages see things differently, if they do.

Other appendices

The facilitator could send out the evaluation form to compile the participants' opinion on the activity and questions discussed. See Annex 1 for a sample evaluation form on upcycling activities which can be adapted for this activity.

Useful resources

Questions about environmental awareness
- https://printdiscuss.com/environment-conversation-questions/
- https://www.learnenglisheveryday.com/questions-about-environment/

Environmental awareness quiz
- https://www.highspeedtraining.co.uk/hub/environmental-awareness-quiz/

Eurobarometer surveys on attitude towards environment
- https://europa.eu/eurobarometer/surveys/browse/all/series/14861

Education for environmental sustainability, EU actions
- https://youthnetworks.net/education-for-environmental-sustainability-eu-actions/

15 to 25 y

2 Introduction to SDGs

2 hours

Tackled problem: Awareness of the sustainable development goals, tackling climate change, collective action and accountability.

Key concepts	• Awareness of SDG goals and their implementation • collective action • accountability
Aim and objectives	The aim of the activity is to introduce the participants with the SDGs. **The objectives:** 1. to find out the participants' perspective on the biggest challenges we face today; 2. to compare their ideas with the actual SDGs; 3. to encourage participants to take initiative in their lives in order to help with the implementation of these goals.
Group size	8 to 20 participants

Desired Outcomes

- The participants are familiar with and have gained knowledge on the SDGs and are able share this knowledge with others, thus promoting the achievement of these goals.
- The participants have strengthened their collaboration skills and ability to discuss matters with their peers.

Materials and hand-outs needed

- Writing materials:
  - pens
  - pencils
  - paper of different sizes
- A computer and a projector for sharing the video and the website of SDGs.

Activity

Preparation and briefing

- Prepare the necessary materials – pens, pencils, paper, computer, projector.
- Once everyone has arrived, the explain that the aim of the activity will be to talk about the challenges the planet and people face today.

Instructions and flow (90 minutes)

1. Invite participants to reflect on the biggest challenges the people and the planet face today. Ask them to write down their ideas. (10 minutes)
2. Divide participants in pairs or in small groups and ask them to share their ideas. Invite participants to discuss all their ideas – which ones were the same, were there any different ideas. (15 minutes)
3. Ask the pairs or small groups to make one list of challenges the people and the planet face today. (10 minutes)
4. Use one pair's or group's idea as a model for the next part of the activity. Suppose the challenge is: "climate change." Ask the participants how can we transform that challenge into a goal that people can work towards? One possibility is: "take climate action." Another possibility is: "reduce plastic waste." Another possibility is: "invest in clean energy." Emphasise that there are many ways to transform a challenge into a goal.
5. Ask the pairs or small groups to transform their list of challenges into goals for the people and the planet. (20 minutes)
6. Reflection. Ask participants to review their goals and see if any goals could be grouped under one category, for example, if one goal is "provide free education to all children" and another goal is "build schools where they are needed," you could group these goals into a category, like "quality education".
7. Ask the pairs or small groups to organise their goals into categories. After, ask each pair or group to share their ideas with others. (20 minutes)
8. Ask all the participants to make one list of goals and categories and put it on paper. (15 minutes)

Debriefing (30 minutes)

1. Share the video on the global goals – Malala introducing the The Worlds Largest Lesson HD | Global Goals (youtube.com) and introduce students to the SDGs.
2. Ask students to reflect: What is one piece of information that you are going to take away from this video?
3. Share the SDGs with the participants. THE 17 GOALS | Sustainable Development (un.org)
4. Invite participants to compare their final list with that of the United Nations: Are there any goals in the United Nations' list that do not appear in your lists? Are there any goals in your lists that do not appear in the United Nations' list? Why might that be?

Tips for facilitators

- This activity can be implemented in any space whether temporary or permanent, the most important thing being that it is possible to use a computer and the projector there, and that there are chairs and tables to be used by participants.
- This activity involves cooperation, so if a group is smaller, divide people in pairs, but if the group is larger, divide them into small groups.
- The duration of the activity is around 2 hours. If it is necessary to have a longer activity, the facilitator might ask the groups to prepare tangible and presentable results, for example, to name their categories, to create logos and to write down specific goals and subgoals of the category – these would be like alternative Sustainable Development Goals, but from the point of view of participants.

Suggestions for follow-up

Organise workshops on each SDG to learn about them in greater detail.

Ideas for action

- Create content on social media to raise awareness of the SDGs.
- Conduct surveys in one's community to find out how much people know about the SDGs.

Other appendices

Create a google forms questionnaire to be filled in by participants on the activity, its usefulness. See sample questionnaire form in Annex 1 which can be adapted for this activity.

Useful resources

- THE 17 GOALS | Sustainable Development (un.org)
- Global goals YouTube page – Makes Total Sense (youtube.com)
- Sustainable Development Goals | United Nations Development Programme (undp.org)
- | Sustainable Development (un.org)

16 to 25 y

3 Let's Play Inventors

1,5 hours

Tackled problem: Redesigning single use products.

Key concepts	• Sustainable design principles • Cradle-to-cradle design • Life cycle assessment • Resource efficiency • Circular economy principles
Aim and objectives	**Aim:** • Learning about cradle-to-cradle design principles. • Improving communication skills through collaboration and discussion. • Promoting creativity in developing sustainable solutions. **Objectives:** • Increase participants' understanding of sustainable design principles, including concepts such as cradle-to-cradle design, life cycle assessment, and circular economy principles. • Encourage participants to think creatively and critically about the environmental and social impacts of everyday objects, as well as opportunities for improvement through sustainable design. • Facilitate collaboration and teamwork among participants as they brainstorm ideas, develop design concepts, and provide feedback to each other. • Provide participants with project-based experience in researching, analysing, and prototyping sustainable design solutions for real-world objects.
Group size	6 to 24 participants

Desired Outcomes

- The participants have gained knowledge on design principles, life cycle assessment, and the concept of circular economy.
- They have improved their critical thinking, problem-solving, collaboration, research skills, and creativity.

Materials and hand-outs needed

- Writing materials: pens, pencils, and paper for participants to take notes and sketch ideas.
- Prototyping supplies (Optional): depending on the availability and scope of the activity and the everyday objects chosen, consider providing materials such as modelling clay, craft supplies, or digital design tools for prototyping.
- Presentation tools (Optional): projector

Activity

Preparation and briefing

Preparation (15 minutes)

- Gather materials and resources needed for the activity. Choose beforehand up to 10 everyday objects you will offer to the participants, for example, tin cans, plastic bottles, old t-shirts and prepare materials that could be used for their reinvention, for example, scissors, paper, paints, glues, yarn, also writing materials and any presentation tools. The selection of materials will depend on the everyday objects you will provide.
- Set up the space to accommodate group discussions and presentations. Move desks together so as to accommodate a group of around 3 people. Make sure there is enough distance between the desks so that groups will not disturb each other.

Briefing (10 minutes)

- Welcome participants and provide an overview of the workshop's objectives, focusing on exploring sustainable design principles and reinventing everyday objects.
- Review the agenda for the workshop and clarify any questions or expectations.

Instructions and flow (90 minutes)

Object Selection/Division (5 minutes):

- Divide participants into groups of 3 (more or less depending on the group size).
- Allow each group to choose an everyday object they wish to “reinvent”, for example, plastic bottles, tin cans, old t-shirts.

Research and Analysis (10 minutes):

- Instruct groups to research and analyse their chosen object, considering materials, manufacturing processes, environmental impact, and end-of-life considerations. Do this by using your phones or computers.
- Encourage participants to take notes and gather relevant information to inform their design process.

Brainstorming and Ideation (15 minutes):

- Facilitate a brainstorming session within each group, encouraging participants to generate ideas and solutions for reinventing their chosen object in a sustainable way. At this stage, put all of your ideas on paper.
- Emphasise creativity, collaboration, and open-mindedness in exploring innovative design concepts and approaches.

Prototyping and Concept Development (10 minutes):

- Provide materials and resources for groups to develop physical or conceptual prototypes of their proposed designs.

Presentation (10 minutes):

- Allocate time for each group to present their proposed design concepts to the rest of the participants.
- Encourage groups to explain their rationale, the sustainability benefits of their proposed design, and any challenges they encountered.
- Ask participants to give feedback to other groups.

Improvements to the design (10 minutes):

- Encourage participants to iterate on their designs, considering feedback from peers and refining their concepts to enhance sustainability and practicality.

Debriefing (30 minutes)

Feedback and Discussion (10 minutes):

- Facilitate a feedback session where participants can offer constructive feedback and ask questions about each group's presentation.
- Encourage open dialogue and reflection on the sustainability implications of the proposed designs.

Reflection and Next Steps (5 minutes):

- Conclude the activity with a reflection session where participants discuss key insights, lessons learned, and potential next steps for implementing sustainable design principles in their personal and professional lives.
- Encourage participants to consider how they can apply the principles of sustainable design in future projects or initiatives.

Tips for facilitators

- Remain flexible and adaptable to the needs and dynamics of the group, adjusting activities or pacing as necessary.
- Keep the workshop on track by managing time effectively and ensuring that each activity is completed within the allotted time frame.
- Create a supportive and inclusive environment where all participants feel comfortable contributing ideas and opinions.
- Encourage participants to reflect on their learning and experiences throughout the workshop, facilitating discussions on key insights and takeaways.

Suggestions for follow-up

- Send out a feedback survey to participants to gather their thoughts on the workshop experience and areas for improvement. See Annex 1 for a sample survey which can be adapted to this activity.
- Provide participants with additional resources, such as articles, books, or online courses, to further explore sustainable design principles and practices.
  - https://mcdonough.com/cradle-to-cradle/
  - https://sustainabilityguide.eu/methods/cradle-to-cradle/

Ideas for action

- Make an exhibition of the participants' prototypes
- Take participants on a field trip to a company that reinvents everyday objects into something else

Other appendices

List of questions for the presentation phase (optional):

- What are the environmental impacts associated with the production, use, and disposal of this object?
- How can we minimise the environmental footprint of this object throughout its entire life cycle?
- How can we optimise resource use in the production of this object, such as energy, water, and raw materials?
- Are there opportunities to incorporate recycled or renewable materials into the design?
- What strategies can be implemented to ensure the responsible disposal or repurposing of this object at the end of its life?
- Can the object be designed for disassembly and recycling to recover valuable materials?
- How can we design the object to encourage sustainable behaviours and consumption patterns among users?
- Are there opportunities to educate and engage users in the sustainable use and disposal of the object?
- How can the object be designed to facilitate its integration into a circular economy, where resources are kept in use and regenerated?
- Are there opportunities for product-service systems or sharing platforms to extend the lifespan of the object?
- What measures can be taken to ensure transparency and ethical sourcing of materials and components used in the production of this object?
- Are there opportunities to support fair labour practices and community development throughout the supply chain?
- How can the design of the object reflect and respect diverse cultural values and perspectives?
- Are there opportunities to promote inclusivity and accessibility in the design and use of the object?
- How can the design of the object anticipate and adapt to future changes in technology, consumer preferences, and environmental conditions?
- Are there opportunities for modular or customizable designs to extend the lifespan and relevance of

Useful resources

- https://mcdonough.com/cradle-to-cradle/
- https://sustainabilityguide.eu/methods/cradle-to-cradle/

4

World Cafe

16 to 30 y

2 hours

Tackled problem: Environmental awareness and sustainable development goals.

Key concepts	• Sustainable development goals (SDGs) • Three dimensions of SDGs • Environmental awareness
Aim and objectives	The aim of the activity is to look at the three dimensions of SDG 7, Affordable and clean energy – economic, social, and environmental. **The objectives are:** 1. to look at SDG 7 and its three dimensions; 2. to promote discussions on topics related to SDGs; 3. to find possible solutions to problems associated with SDGs.
Group size	12 to 24 participants

Desired Outcomes

- The participants have acquired knowledge on the three dimensions of SDG 7.
- They have learned new facts associated with the specific topic and they are more aware of the problems we're facing nowadays and are willing to find solutions.

Materials and hand-outs needed

- Tables and chairs
- Table cloth
- Some flowers to put on the table (optional)
- A4 paper
- Coloured pens
- Cards on SDG 7 (Annex 2)

Activity

Preparation and briefing

- The facilitator needs to print out the three cards provided in Annex 2. Each group of four participants will need one card, so the number of copies to be printed depends on the number of participants. We suggest having three groups, to cover each dimension of the SDG. If there are more participants, just print out more cards.
- The facilitator needs to create a special environment most often modeled after a café, i.e. small round tables covered with a checkered or white linen tablecloth, A4 paper, colored pens, a vase of flowers, and optional "talking stick" item. There should be four chairs at each table (optimally) – and no more than five.

Instructions and flow

Welcome and introduction (20 minutes)

- Begin with a warm welcome and an introduction to the World Café process, explaining that the world cafe is an activity for hosting a large group dialogue.
- Explain that today's dialogue will be about SDG 7.
- Share the Cafe Etiquette – being polite, listening to others, respecting others' opinions.
- To put participants at ease, you might choose to do an icebreaker, for example, ask everyone to make a circle, and ask each of the participants to tell two truths and a lie. The other participants have to guess which was the lie.

Small-group rounds (60 minutes)

The process begins with the first of three or more twenty-minute rounds of conversation (the number of rounds depends on the time available and the number of participants).

1. Divide participants into groups of four and seat them at tables.
2. Put one of the cards on each table (the card will stay on the table for the whole duration of the activity) and ask them to work in groups to read the card and the question provided at the end of it. Tell them they have 20 min for discussions. Ask them to put their ideas and possible solutions on paper.
3. At the end of the twenty minutes, each member of the group moves to a different new table to work with another card, leaving one person at the table as a "host" who will fill in the next group about what happened during the discussions and will briefly present their findings.
4. Once the participants have changed tables, start the next 20 min round. First, ask the "host" to briefly explain what the other group talked about, and then tell the participants to read the card and answer the question at the end of the card.
5. Repeat the same for round three.

Debriefing

Harvest (20 minutes)

- Ask each host of the table to present the main findings of the table based on the ideas and possible solutions put down on paper.
- Ask each participant to elaborate on their experience during discussions by asking the following questions:
  - Did you learn something new?
  - What was the most surprising thing you learned through discussions?
  - Was it easy to agree on possible solutions?
  - Have these discussions changed your attitude towards clean energy?

Tips for facilitators

- This activity is perfect for three groups of four people. If you have less people, it might be a good idea to reduce the number of cards you're using, for example, use only one dimension of the SDG. Or you can make up groups of three people, not four.
- It is not a problem if the group is larger, you can simply make more groups or increase the number of participants in one group, but you should not exceed five people per group.
- The activity can be conducted in both permanent and temporary spaces, the important thing is to have tables and chairs.

Suggestions for follow-up

- Organise world cafes also on other SDGs.

Ideas for action

- Create content on social media to raise awareness of SDG 7.

Other appendices

Sample evaluation form in Annex 1 which can be adapted for this activity.

Useful resources

The world cafe method has several useful resources:

- https://theworldcafe.com/tools-store/hosting-tool-kit/
- https://theworldcafe.com/services-programs/signature-learning-programs/
- https://thecommunitytable.ning.com/main/authorization/signUp?target=https%3A%2F%2Fthecommunitytable.ning.com%2F%3Fxgi%3Df521WRfo3TUDcU

RENEWABLE ENERGY

10 to 18 y

5 Using Hydropower to Lift

≈ 45 min

Tackled problem: Understanding how hydropower can be used to convert kinetic energy from falling water into mechanical energy.

Key concepts	• Hydropower • Energy conversion • Renewable energy sources • Kinetic energy • Mechanical energy
Aim and objectives	The goal of this activity is to educate participants on hydropower by converting the kinetic energy of falling water into mechanical energy to lift a small weight. It provides hands-on experience and a deeper understanding of energy conversion principles.
Group size	2 to 20 participants

Desired Outcomes

- Knowledge of hydropower and its applications
- Skills in constructing a waterwheel and measuring flow rates
- Understanding of renewable energy sources and their importance
- Development of problem-solving and analytical skills

This activity links to GreenComp by promoting awareness and understanding of renewable energy sources, specifically hydropower, and fostering skills in sustainable energy practices

Materials and hand-outs needed

- Aluminum pie plate (23 cm)
- Scissors
- Permanent marker
- Ruler
- Drill with 9.5 mm drill bit or hammer and nail
- Nylon spacer (9.5 mm inner diameter, 9.5 mm thick)
- Epoxy glue
- Scotch tape
- Wood dowel (8 mm wide, 61 cm long)
- Plastic bucket with removable handle (13 liters)
- Cotton string (76 cm long piece)
- Metal nut or small metal object
- Measuring cup (500 ml)
- Stopwatch
- Lab notebook

Activity

Preparation and briefing (5 minutes)

Introduce the Concept: Start by explaining the basic principles of hydropower and the water cycle. Emphasise how the energy from falling water is converted into mechanical energy through a waterwheel.

Explain the Objective: Inform participants that they will build a small waterwheel to understand how hydropower works. Highlight that safety is important throughout the activity.

Safety Instructions:
- Caution participants when using scissors and aluminium sheets to avoid cuts.
- Remind participants to use protective eyewear and to keep their hands clear when drilling.
- Advise participants to follow the manufacturer's safety guidelines when using epoxy glue and avoid contact with skin.

Visual Outline: Provide a brief visual outline or diagram of the steps. A visual aid will help participants understand the construction process more clearly.

Instructions and flow (30-40 minutes)

Step 1: Prepare the Aluminium Pie Plate (5 minutes)
- Give participants an aluminium pie plate and a pair of scissors. Instruct them to carefully cut out the flat bottom part of the pie plate.
- Remind participants to handle the scissors with care and avoid sharp edges of the aluminium.
- Next, hand out permanent markers and a waterwheel template. Ask participants to trace the design onto the aluminium circle and draw lines from the edge to about 2 cm from the middle.

Step 2: Cut and Bend the Paddles (5 minutes)
- Give participants the instructions to cut along the eight solid lines on the aluminium. These cuts will form the paddles of the waterwheel.
- Warn participants about sharp edges after cutting and recommend that they smooth any jagged edges with scissors.
- Once the cuts are complete, instruct participants to carefully bend each paddle at the dotted line. Use a ruler to make a straight bend for accuracy.

Step 3: Drill a Hole in the Center (1 minute)
- Distribute 9.5 mm drill (or a hammer and nail as an alternative). Tell participants to drill a hole through the center of the waterwheel. Ensure they know the hole must be large enough for the dowel to fit through.
- Emphasise the use of protective eyewear when drilling and advise participants to place the aluminium on a stable surface before starting.

Step 4: Attach the Nylon Spacer (2 minutes + drying time)
- Provide participants with epoxy glue and nylon spacers. Explain that they should apply glue to the middle of the waterwheel and attach the nylon spacer.
- Remind participants to follow the epoxy glue's safety instructions, avoid skin contact, and wash hands thoroughly if needed.
- Explain that the glue will take 15-30 minutes to dry, depending on the product.

Step 5: Secure the Spacer (1 minute)
- Once the glue has dried, give participants thin strips of Scotch tape. Instruct them to tape the spacer securely to the waterwheel, ensuring the hole in the center is not covered.

Step 6: Prepare the Bucket (5 minutes)
- Hand out buckets with removable handles. Ask participants to remove the handle and drill two 9.5 mm holes where the handle used to be. The dowel should be able to fit through the holes and spin freely.
- Remind participants to take care when drilling into the bucket to avoid slipping or damage.

Step 7: Attach the Waterwheel to the Dowel (5 minutes)

- Give participants the wood dowel and Scotch tape. Instruct them to wrap a piece of tape around the middle of the dowel to add thickness and keep the waterwheel in place.
- Explain that participants need to insert the dowel through the holes in the bucket and attach the waterwheel by sliding it over the tape. Once inserted, the waterwheel should spin along with the dowel.

Step 8: Test the Waterwheel (10 minutes)

- Ask participants to measure the flow rate of their water source using a 500 ml measuring cup and stopwatch. Instruct them to note the time it takes to fill the cup in their lab notebook.
- Place the waterwheel under the flowing water, measure the height of the water, and record it. Time how long it takes for the waterwheel to lift a small weight tied to the string. Repeat the process two more times and record the results.

Step 9: Experiment with Different Flow Rates (7 minutes)

- Instruct participants to adjust the flow rate of the water and repeat the steps. Ensure they keep the water height consistent. Test the waterwheel at three different flow rates and record the times for lifting the weight.

Debriefing (10-15 minutes)

- Review the key concepts learned during the activity.
- Discuss any challenges faced and how they were overcome.
- Highlight the importance of renewable energy sources.

Tips for facilitators

- Ensure all safety measures are followed when using tools like drills or hammers.
- For larger groups, divide participants into smaller teams to ensure everyone has hands-on experience.
- For shorter durations, prepare some parts of the waterwheel in advance.
- Adapt the activity for different spaces by choosing appropriate water sources and working areas.

Suggestions for follow-up

- Explore other renewable energy sources such as solar and wind power.
- Conduct a project on designing a small-scale hydropower plant.
- Visit a local hydropower facility for a practical understanding of large-scale applications.

Ideas for action

- Encourage participants to implement simple hydropower projects at home or in their communities.
- Organise a competition for the most efficient waterwheel design.

Other appendices

- Provide a waterwheel template and step-by-step guide.
- Include a list of local resources for obtaining materials.

Useful resources

- Hydropower facts and information (nationalgeographic.com)
- Put Your Water to Work: Using Hydropower to Lift a Load | Science Project (sciencebuddies.org)

10 to 18 y

6 Could the Colour of Your House Potentially Lower Your Energy Footprint?

≈ 4 hours, spread over a day to account for paint drying times

Tackled problem: Investigating how the color of a house affects its internal temperature and potential energy savings.

Key concepts	• Heat absorption • Insulation • Energy efficiency • Renewable energy principles
Aim and objectives	The goal of this activity is to investigate if the colour of a structure affects the temperature inside the structure in different environments. This will help participants understand the principles of heat absorption and energy efficiency.
Group size	2 to 20 participants

Desired Outcomes

- Knowledge of how colour affects heat absorption
- Skills in conducting scientific experiments and recording data
- Understanding of energy efficiency and its importance in building design
- Analytical skills in comparing and interpreting data

This activity links to GreenComp by promoting energy-efficient practices in building design and encouraging sustainable living choices.

Materials and hand-outs needed

- Shoe boxes (3, same size)
- Paint (white, grey, and black; latex or acrylic)
- Paintbrush
- Thermometers (4)
- Heat lamp
- Large tray
- Ice
- Rock salt
- Plastic bag (preferably white)
- Lab notebook

Activity

Preparation and briefing (5 minutes)

Introduce the Concept: Begin by introducing the concept of heat absorption and explaining how it impacts energy efficiency in buildings. Explain that participants will explore how the colour of a house can affect its internal temperature and its energy consumption.

Explain the Objective: Tell participants that they will conduct an experiment using shoeboxes painted in different colours (white, grey, black) to simulate how these colours impact temperature in various conditions.

Safety Instructions:
- Remind participants to work carefully when using paint and to avoid contact with eyes and skin.
- Instruct participants to keep the heat lamp at a safe distance from the boxes and never touch it while it's hot.
- Ensure that all materials, especially the heat lamp and paint, are handled responsibly and in a well-ventilated space.

Visual Outline: Provide students with a diagram or visual guide of the steps they will follow, including shoebox setup, painting, data collection, and temperature measurement. This visual outline will help them understand the activity process better.

Instructions and flow (170-200 minutes)

Step 1: Prepare the Shoe Boxes (5 minutes + drying time)
- Ask participants to collect three identical shoeboxes. Make sure they have paintbrushes and three paint colours (white, grey, and black).
- Instruct participants to carefully paint one box white, one box grey, and one box black. They should apply an even layer of paint and avoid making a mess.
- Remind participants to avoid getting paint on their skin and to wash their hands immediately if they do. Ensure the space is well-ventilated to avoid paint fumes.
- Let the boxes dry completely

Step 2: Create data table (10 minutes)
- Instruct participants to make a data table in their lab notebooks. The table should have columns for "Starting Temperature," "Room Temperature," "Heated Temperature," and "Cooled Temperature". Additionally, the table should have rows for separate colours.
- Ensure all participants have their data tables ready before continuing.

Step 3: Investigate Room Temperature Effects (45 minutes)
- Place one thermometer inside each shoebox and one on the table to record the surrounding room temperature.
- Instruct participants to record the "Starting Temperature" of each thermometer in their data table (degrees Celsius).
- Ask participants to put the lids on the boxes and leave them at room temperature for 30 minutes.
- After 30 minutes, instruct participants to remove the lids and quickly record the "Room Temperature" inside the boxes in their data table.

Step 4: Investigate Heated Temperature Effects (40 minutes)
- Instruct participants to place the lids back on the boxes and move them into direct sunlight or under a heat lamp to simulate a sunny day.
- Ensure that the boxes are placed at equal distances from the light source, and the external thermometer is placed in the center to monitor the environment temperature.
- Remind participants to avoid touching the heat lamp during or after use, as it can get very hot.
- Leave the boxes under the heat lamp for 30 minutes. Afterward, carefully remove the lids and have participants record the "Heated Temperature" inside the boxes in their data tables.

Step 5: Investigate Cooled Temperature Effects (40 minutes)

- Prepare a tray of ice by sprinkling rock salt over it and covering it with a white plastic bag.
- Instruct participants to place the lids back on the boxes and set them on the ice tray, making sure they are arranged at equal distances from the light source.
- Leave the setup for 30 minutes. Afterward, carefully remove the lids and instruct participants to record the "Cooled Temperature" inside the boxes in their data tables.

Step 6: Analyse Data and Create Graphs (30 minutes)

- Hand out buckets with removable handles. Ask participants to remove the handle and drill two 9.5 mm holes where the handle used to be. The dowel should be able to fit through the holes and spin freely.
- Remind participants to take care when drilling into the bucket to avoid slipping or damage.

Debriefing (5 minutes)

- Lead a discussion to review the key concepts learned, such as how different colours affect heat absorption and energy efficiency.
- Ask students how they might apply these findings to real-world building design, discussing how choosing specific materials and colours can impact energy consumption.

Tips for facilitators

- Ensure safety measures are followed when using the heat lamp.
- For larger groups, divide participants into smaller teams to ensure everyone is engaged.
- For shorter durations, prepare the painted boxes in advance.
- Adapt the activity for different spaces by choosing appropriate working areas and ensuring adequate ventilation when using the heat lamp.

Suggestions for follow-up

- Explore how different materials (besides colour) affect heat absorption.
- Conduct similar experiments with different environmental conditions (e.g. humid vs. dry).

Ideas for action

- Encourage participants to apply what they've learned by choosing energy-efficient materials and colours for their homes.
- Organise a competition to design the most energy-efficient model house

Other appendices

- Provide a detailed guide and templates for creating energy-efficient home models based on the concepts learned during the activity.
- Include a list of local resources for obtaining materials, such as paint and thermometers, to make the experiment accessible.
- Include a list of local resources for obtaining materials.

Useful resources

- Best Exterior Home Colors for Energy Efficiency — Absolute A Painting Company
- How Does Color Affect Heating by Absorption of Light? | Science Project (sciencebuddies.org)

10 to 18 y

7 Can Wind Power Generate Electricity?

60 minutes

Tackled problem: Exploring how wind speed and turbine blade design affect energy production.

Key concepts	• Wind energy • Renewable energy • Electricity generation • Experimental design and testing
Aim and objectives	The goal of this activity is to investigate how different wind turbine blade designs affect electricity generation and to understand the principles of wind energy.
Group size	2 to 20 participants

Desired Outcomes

- Knowledge of wind energy and its applications
- Skills in designing and constructing simple wind turbines
- Understanding of how blade design affects energy production
- Development of experimental and analytical skills

This activity links to GreenComp by promoting the understanding and application of renewable energy technologies, specifically wind power, and encouraging sustainable energy practices.

Materials and hand-outs needed

- Cardboard or plastic sheets (for blades)
- Small DC motors
- LED bulbs
- Multimeter
- Wooden dowels or rods
- Hot glue gun and glue sticks
- Scissors or utility knife
- Anemometer
- Lab notebook
- Fan

Activity

Preparation and briefing (10 min)

Introduce the Concept: Begin by explaining the concept of wind energy and its role in generating clean, renewable electricity. Highlight the importance of wind power in reducing greenhouse gas emissions and dependence on fossil fuels.

Explain the Objective: Tell participants they will explore how different wind turbine blade designs affect electricity generation. The goal is to experiment with design variations to determine which design is the most efficient in generating electricity.

Before starting the experiment, introduce the tools that participants will be using. The **anemometer** is a device used to measure wind speed. In this activity, participants will use it to record the wind speed in front of the fan to ensure consistent conditions for each turbine design test. To use the anemometer, participants should hold it in front of the fan at the same distance as the turbine, note the wind speed reading, and record it in their lab notebooks before running the experiment for each blade design. The **multimeter** is used to measure electrical values such as voltage, current, and resistance. In this experiment, it will measure the voltage generated by the wind turbine. To use the multimeter, participants will connect it to the DC motor's output terminals, set it to measure DC voltage, and record the voltage reading once the turbine blades start spinning. This data will help them compare which blade design is the most efficient at generating electricity.

Provide a Visual Outline: Show a visual guide or diagram illustrating the steps of the activity. This might include an image of how to cut the blades, assemble the turbine, connect the motor, and measure the results. Visual aids will help participants better understand the construction process and the setup for the experiment. You can also provide a flow chart of the experimental process to help participants track each step. See additional sources for available online materials.

Safety Instructions:

- Ensure participants understand the safe use of tools like hot glue guns and scissors. Emphasise the importance of wearing protective gear like gloves and safety glasses when handling these materials.
- Warn participants to handle the DC motor carefully and avoid touching electrical components with wet hands.

Instructions and flow (30–40 minutes)

Step 1: Create Turbine Blades (10 minutes)

- Ask participants to cut the cardboard or plastic sheets into different blade shapes and sizes. Encourage them to experiment with various designs, such as straight, curved, or angled blades.
- Remind participants to handle scissors or utility knives carefully when cutting the blades to avoid injury

Step 2: Assemble the Wind Turbine (5 minutes)

- Guide participants in attaching the blades to the shaft of the small DC motor. Ensure they use the hot glue gun to secure the blades firmly in place.
- Mount the DC motor on top of a wooden dowel or rod to act as the turbine stand. Ensure the turbine is stable and can rotate freely.
- Remind participants to be cautious when using the hot glue gun to avoid burns and always place it on a heat-resistant surface after use.

Step 3: Set Up the Experiment (5 minutes)

- Place the wind turbine in front of a fan to simulate wind conditions. Make sure participants position the fan at a consistent distance to ensure uniform wind speed.
- Connect the LED bulb to the DC motor so that the bulb will light up when the motor generates electricity.

Step 4: Measure Initial Conditions (10 minutes)

- Have the participants prepare their lab notebooks, creating sections to record wind speed, voltage generated, and other key observations. This will help ensure organised data collection. Use the anemometer to record the wind speed in their lab notebooks as part of their initial conditions for the experiment.

Step 5: Collect Data on Power Generation (5 minutes)

- Turn on the fan and observe whether the LED bulb lights up. If the turbine generates enough power, the bulb will illuminate.
- Have participants use the multimeter to measure the voltage generated by the DC motor. Instruct them to record this value in their lab notebooks.

Step 6: Experiment with Blade Designs (10 minutes)

- Instruct participants to modify the blade designs and repeat the experiment for each new design. For example, they might test longer blades, different angles, or more aerodynamic shapes.
- Record the wind speed and voltage generated for each design. Ensure that participants perform the tests under the same conditions (same distance from the fan, consistent wind speed) for accurate comparisons.

Step 7: Analyse the Data and Draw Conclusions (5 minutes)

- Once all the data has been collected, have participants create a data table that compares the voltage generated by each blade design at various wind speeds.
- Ask participants to determine which blade design was most efficient at generating electricity and why.
- Encourage a discussion on how these results could be applied to real-world wind turbines and how turbine design could be optimised for different wind conditions.

Debriefing (10–15 minutes)

- Review the key concepts learned during the activity, including how wind energy is generated and how blade design affects power production.
- Discuss the real-world implications of wind turbine design and how optimising these designs could lead to more efficient energy production.
- Reflect on how different blade shapes and materials can influence the efficiency of wind energy systems, promoting sustainable energy solutions.

Tips for facilitators

- Ensure all safety measures are followed when using the hot glue gun and handling electrical components.
- For larger groups, divide participants into smaller teams to ensure everyone is engaged.
- Prepare some materials in advance (e.g. pre-cut blades) to save time.
- Adapt the activity for different spaces by ensuring adequate ventilation and safe distances from the fan.

Suggestions for follow-up

- Explore how different environmental conditions (e.g. varying wind speeds) affect turbine performance.
- Visit a wind farm.

Ideas for action

- Encourage participants to implement wind energy projects in their communities.
- Organise a competition for the most efficient wind turbine design.

Other appendices

- Provide a template for the data table.
- Include instructions for creating graphs. After collecting the data, participants will create graphs to visualise their results. They can do this either by hand or using online tools such as **Google Sheets**, **Plotly**, or **Meta-Chart**. To create a graph by hand, participants should plot the wind speed or blade design on the x-axis and the voltage generated on the y-axis, using a bar or line graph to compare the results. If using an online tool, they can input their data into a spreadsheet or use platforms like Plotly or Meta-Chart to generate professional-looking graphs quickly and easily. These visual representations will help participants compare and analyse which blade design generated the most electricity under various wind speeds.

Useful resources

- Wind Power Information and Facts (nationalgeographic.com)
- U.S. Department of Energy – Wind Energy Basics: This site offers clear explanations about how wind energy contributes to reducing carbon emissions.
- International Renewable Energy Agency (IRENA): Provides global statistics and reports on renewable energy, including wind energy's role in reducing environmental impact.

Suggested Visual Guides:
- Science Buddies Wind Turbine Guide
- Exploratorium Wind Turbine Activity

10 to 18 y

8 Solar Updraft Tower

45 minutes

Tackled problem: Understanding how heat can be converted into electrical energy using solar updraft technology.

Key concepts	• Solar energy • Heat absorption • Airflow and updraft • Renewable energy principles
Aim and objectives	The goal of this activity is to explore how heat can be converted into electrical energy by building a simple solar updraft tower, and to understand the principles of heat absorption and airflow.
Group size	2 to 20 participants

Desired Outcomes

- Knowledge of solar energy and updraft towers
- Skills in constructing and experimenting with renewable energy devices
- Understanding the principles of heat absorption and airflow
- Development of observational and analytical skills

This activity links to GreenComp by promoting the understanding and application of solar energy technologies, and encouraging sustainable energy practices.

Materials and hand-outs needed

- Black construction paper (about 50 x 50 cm)
- Smaller piece of construction paper (any colour)
- Pencil
- Scissors
- Tape
- Piece of modelling clay
- Wooden skewer
- Needle
- Thermometer
- Lamp with incandescent light bulb or heat lamp
- Paper
- Optional: sunshine and a wind-protected area outside
- Optional: timer
- Optional: white construction paper

Activity

Preparation and briefing (5 min)

Introduce the Concept: Begin by explaining the concept of solar updraft towers and how they can generate electricity by using heated air to create an updraft. Discuss their real-world applications and the importance of using solar energy to reduce reliance on non-renewable energy sources.

Explain the Objective: Tell participants that they will build a simple solar updraft tower to observe how heat can be converted into airflow, which can then be harnessed to create mechanical energy.

Safety Instructions:
- Remind participants to handle scissors and other sharp tools carefully when cutting the construction paper.
- Ensure participants maintain a safe distance from the heat lamp and avoid direct contact with hot surfaces.
- Supervise the use of the needle to prevent injuries, and remind participants to keep hands away from the pointed tip.

Provide a Visual Outline: Show a diagram or visual guide that illustrates the assembly of the cone, the placement of the propeller, and the experiment setup. This will help participants understand how the parts of the solar updraft tower work together to create an updraft.

Instructions and flow (30–40 minutes)

Step 1: Create the Cone (10 minutes)
- Instruct participants to roll the black construction paper into a cone shape, ensuring that the top opening is about 5 cm in diameter and the bottom opening is about 10 cm in diameter.
- Remind participants to handle the scissors carefully and avoid cutting toward themselves when trimming the edges and cutting the arches.
- Use tape to secure the cone in place, ensuring the top and bottom edges are cut evenly so the cone can stand upright.
- Ask participants to cut three equally spaced arches, each 5 cm by 1.3 cm, at the bottom of the cone to serve as air inlets. Make sure the cone can still stand on its rim after cutting.

Step 2: Create the Propeller (5 minutes)
- Instruct participants to cut a 7.5 cm diameter circle from the construction paper and shape it into a propeller by bending the blades downward at a 45-degree angle.
- When taping the needle to the wooden skewer, remind participants to be cautious and keep the sharp point of the needle facing away from their hands. Suggest using gloves if necessary.

Step 3: Set Up the Experiment (5 minutes)
- Have participants create a ball of modelling clay and place it at the centre of their workspace.
- Place the black paper cone over the modelling clay so that the clay is centred inside the cone.
- Insert the wooden skewer into the clay through the top opening of the cone, ensuring the needle sticks out 4-5 cm from the top of the cone.
- Balance the propeller on top of the needle so it can spin freely.
- Ensure participants are careful when placing the propeller on the needle to avoid poking themselves. Supervise closely to prevent accidents.

Step 4: Measure Initial Conditions (5 minutes)
- Have participants measure and record the air temperature inside and outside the tower using a thermometer. Instruct them to note these measurements in their lab notebooks.
- Make sure participants are aware of safe handling of thermometers, especially if they are fragile or made of glass.

Step 5: Observe the Updraft (10 minutes)

- Instruct participants to place a lamp next to the base of the tower, directing the light and heat toward the bottom of the cone. Ensure there are no external airflow sources that could interfere with the experiment.
- Ask participants to switch the lamp on and observe the movement of the propeller for 2-5 minutes, recording any observations.
- After 5 minutes, have participants measure the air temperature inside and outside the tower again and record the values in their notebooks.
- Remind participants to avoid touching the heat lamp while it is on or immediately after use to prevent burns. Instruct them to keep the lamp at a safe distance from other materials to avoid accidental fires.

Step 6: Cool Down Observation (10 minutes)

- Switch off the lamp and instruct participants to observe the tower for another 5-10 minutes, noting how the airflow changes as the tower cools down.
- After 5 minutes, ask participants to take a final measurement of the air temperature inside and outside the cone, recording these results in their lab notebooks.
- Remind participants to be cautious when handling any warm components after the experiment and allow time for everything to cool before cleaning up.

Debriefing (5 minutes)

- Review the key concepts learned during the activity, including how the updraft is generated by heating the air inside the tower.
- Discuss how the experiment demonstrates the principles of solar updraft towers and their potential real-world applications for generating electricity.
- Reflect on how this simple experiment connects to larger-scale renewable energy technologies and their role in sustainable energy solutions.

Tips for facilitators

- Ensure all safety measures are followed when using the heat lamp.
- For larger groups, divide participants into smaller teams to ensure everyone is engaged.
- Prepare some materials in advance (e.g. pre-cut construction paper) to save time.
- Adapt the activity for different spaces by ensuring a wind-protected area for accurate results.

Suggestions for follow-up

- Explore how different materials (e.g. white vs. black construction paper) affect the updraft.
- Conduct a project on designing a larger-scale solar updraft tower.

Ideas for action

- Encourage students to implement solar energy projects in their communities.
- Organise a competition for the most efficient updraft tower design.

Other appendices

- Provide a template for the data table.
- Include instructions for creating graphs. After collecting the data, participants will create graphs to visualise their results. They can do this either by hand or using online tools such as **Google Sheets**, **Plotly**, or **Meta-Chart**. To create a graph by hand, participants should plot the wind speed or blade design on the x-axis and the voltage generated on the y-axis, using a bar or line graph to compare the results. If using an online tool, they can input their data into a spreadsheet or use platforms like Plotly or Meta-Chart to generate professional-looking graphs quickly and easily. These visual representations will help participants compare and analyse which blade design generated the most electricity under various wind speeds.

Useful resources

- Solar Power Information and Facts (nationalgeographic.com)
- Solar updraft tower Wikipedia
- What Is a Solar Updraft Tower? Carbon Collective Investment
- Build a Solar Updraft Tower | STEM Activity (sciencebuddies.org)

CIRCULAR ECONOMY

16 to 30 y

9 From Trash to Treasure

2 hours

Tackled problem: Waste

Key concepts	• Environmental awareness and sustainability • Waste reduction • Creativity • Resourcefulness
Aim and objectives	**Aim:** To educate participants about upcycling as a means to reduce waste and promote creativity. **Objectives:** • To teach practical upcycling techniques. • To encourage participants to think creatively about waste materials. • To raise awareness about environmental impact.
Group size	6 to 20 participants

Desired Outcomes

- Knowledge of upcycling techniques.
- Skills in repurposing materials.
- Attitudes towards reducing waste and promoting sustainability.

Materials and hand-outs needed

- Assorted recyclable materials (e.g. old t-shirt, a jar, some buttons, cardboard, and fabric, magazines, bottles, string, and leftover paper rolls)
- Crafting tools (scissors, glue, paint, brushes)
- Hand-outs on upcycling tips and techniques
- Photos of sample upcycled projects for inspiration

Activity

Preparation and briefing (10 min)

- Welcome and introduction to upcycling.
- Brief explanation of the importance of reducing waste.

For the explanation, the facilitator can make use of engaging and visually appealing tools to help participants understand complex topics such as waste reduction, upcycling, and sustainability. A PowerPoint presentation provides a clear structure, can combine text with visuals, and is an effective way to present key concepts.

- Brief video about circular and linear economy, life cycle of an object, impact of plastic, packaging and waste.

- https://www.youtube.com/watch?v=zCRKvDyyHml
- https://www.youtube.com/watch?v=BiSYoeqb_VY
- https://youtu.be/iO3SA4YyEYU

The video content should not be just passive watching but rather integrated into the workshop with active engagement strategies.

Before Playing the Video:

- Ask participants what they know about the environmental impact of waste. Write down their responses on a flipchart or whiteboard.
- Pose questions like:
  - "What do you think happens to most of the waste we produce?"
  - "What are some ways you personally try to reduce waste?"

This pre-video brainstorming will engage the participants' prior knowledge and get them thinking about the topic before they see the video.

After the video:

- Organise a short reflection session where you ask participants to share their thoughts. Use open questions like:
  - "What part of the video stood out to you the most?"
  - "How do you think the concept of a circular economy can help reduce waste?"
  - "What did you learn about the lifecycle of products and materials?"

For larger groups, divide participants into pairs or small groups to discuss the video and then share key points with the larger group. This promotes participation from everyone.

Other activities:

- Quiz: before the video, use a quick online poll (e.g. Google Forms, Kahoot) to ask participants about their current knowledge of waste and recycling. This will also help you gauge the group's understanding.
- Post-it: after the video, distribute sticky notes and ask participants to write down one key takeaway from the video. Stick the notes on a board and review them as a group to spark further discussion.
- Mind mapping: create a mind map where the participants add their ideas on how upcycling can reduce waste. Start with "Waste" in the centre and expand outward with solutions they saw in the

Instructions and flow (90 minutes)

Step 1: hands-on demonstration (20 minutes)

- Introduction to the Demonstration:
  - Begin by briefly explaining what upcycling is and how it differs from recycling. Emphasise the idea of turning "trash into treasure" by giving waste materials a new, creative function.
  - Highlight the environmental benefits of upcycling, such as reducing waste, conserving resources, and minimising the environmental footprint.

- Live Demonstration of upcycling techniques:
  - Example 1: Turning old jars into planters:
    - Show the participants an old glass jar.
    - Explain how it can be upcycled into a small planter by adding soil and plants.
    - Demonstrate how to clean and decorate the jar using paint, fabric, or old magazines.
  - Example 2: Creating jewellery from discarded items:
    - Present discarded items like old buttons, fabric scraps, or broken jewellery.
    - Show how they can be repurposed into wearable pieces like bracelets or earrings.
    - Demonstrate simple techniques like threading beads or attaching hooks using jewellery-making tools.
    - Encourage participants to get creative with combining materials.

- Show-and-tell (Optional):
  - If possible, bring pre-made upcycled items from home to give participants physical examples of what can be done with recycled materials. This can spark ideas and show practical uses for upcycled products.

Step 2: Group activity (30 minutes)

- Group formation:
  - Divide participants into small groups of 3-4 people. This ensures that everyone gets a chance to contribute ideas and work together in a meaningful way.
    - By colours or symbols: hand out small coloured pieces of paper or cards with different symbols (e.g. stars, circles, triangles). Each colour or symbol represents a group.
    - Counting: have participants count off by numbers (e.g. 1 to 4). All the "ones" form the first group, all the "twos" form the second, and so on.
    - Animal Sounds: assign each participant an animal name, like "cat," "dog," "bird," and have them find their group by making the sound of that animal (without talking).
    - Create groups ahead of time, either randomly or based on specific criteria (e.g. mixing introverts and extroverts, varying skill levels).

- Distribution of Materials:
  - Each group receives a box or collection of assorted recyclable materials (e.g. glass bottles, cardboard, magazines, fabric scraps, plastic containers).
  - Ensure that each box contains a variety of items that could be combined to create different types of projects. For example:
    - A box might include an old t-shirt, a jar, some buttons, cardboard, and fabric.
    - Another box might include magazines, bottles, string, and leftover paper rolls.

- Brainstorming Session:
  - Encourage the groups to look through their materials and discuss potential upcycling projects.
  - Facilitator Role:
    - Circulate around the room and engage with each group by asking open-ended questions like:
      - "What do you think this material could be turned into?"
      - "How could you combine different materials to create something new?"
    - Offer ideas or inspiration if needed, but let participants take the lead in generating ideas.

- Decision-Making:
  - Give each group 5–10 minutes to settle on a project idea based on their available materials.
  - Encourage them to select a project that is achievable within the given time and that makes creative use of their resources.
  - Examples could include turning magazines into collages, creating planters from bottles, or making tote bags from old t-shirts.

Step 3: Creation phase (40 minutes)

- Building the Projects:
  - Groups begin executing their upcycling ideas based on the materials they have.
  - Facilitator's Role:
    - Move around the room and check on each group, offering guidance where needed.
    - Encourage participants to think creatively when facing challenges, such as:
      - "If the bottle is too flimsy, how could you reinforce it?"
      - "What can you add to this jar to make it more decorative?"
    - Remind participants to share tasks within the group, allowing everyone to participate in some part of the project.
  - Examples of Tasks:
    - One participant may cut fabric while another paints jars.
    - One person may brainstorm while another assembles the project.

- Safety and Practicality:
  - Ensure participants are handling tools safely (e.g. scissors, glue guns).
  - Give practical advice, such as how to apply glue properly, paint evenly, or reinforce materials like cardboard for stability.

- Time Management:
  - Tip for Participants: Encourage them to work efficiently and divide tasks among the group.
  - Provide time reminders (e.g. "You have 20 minutes left!") to ensure everyone stays on track and can finish their projects within the 40-minute timeframe.

- Encourage Creativity and Resourcefulness:
  - Encourage participants to think outside the box. For example:
    - How can they make the project not only functional but also visually appealing?
    - Suggest embellishments like painting, adding designs, or using leftover materials for decoration.

- Final Touches:
  - In the last 5–10 minutes, participants can add final touches to their projects (e.g. decorative finishes, attaching final pieces).
  - Facilitators can help with quick fixes or troubleshooting any issues (e.g. if a piece falls apart, suggest how to strengthen it).

Debriefing (5 minutes)

Each group presents their upcycled creation to the rest of the participants.
Reflection discussion:

- What did they learn from the activity?
- How can they apply upcycling techniques in their daily lives?

Tips for facilitators

- Encourage creativity and experimentation.
- Provide guidance on safety when handling tools and materials.
- Foster a collaborative atmosphere among participants.
- Create an informal environment maybe with some music.
- Suggest to create objects that are useful and last longer.

For smaller groups (6–10 participants) provide more individualised attention by having facilitators spend more time guiding participants through the upcycling process.
For larger groups (20+ participants) split the participants into smaller sub-groups to ensure everyone can participate meaningfully. Assign additional facilitators or volunteers to each group to help manage and guide the activities. You might also consider reducing the complexity of the projects to ensure that everyone finishes within the given time.

For a shorter duration (e.g. 1 hour) focus on one or two simple upcycling projects, such as transforming jars into planters. Skip the video or reduce the duration of the reflection discussion to save time. Alternatively, prepare pre-cut materials or partially completed projects so participants can jump straight into the creative phase.
For a longer duration (e.g. 3+ hours) include additional activities such as a deeper exploration of environmental topics, more elaborate upcycling projects, or even an introduction to advanced techniques like sewing or woodworking. Consider hosting a design challenge where groups can prototype multiple items, present them to the entire group, and receive feedback. You can also integrate breaks and allow more time for brainstorming and refinement.

For smaller spaces opt for compact projects that require minimal space, such as jewellery making or small-scale décor items. Arrange the seating and workstations to maximise the available space, and consider rotating the groups between different activity stations to avoid overcrowding. For larger spaces take advantage of the space by organising more hands-on activities that involve larger materials or outdoor-friendly projects, such as creating garden décor or upcycled furniture. Larger spaces also allow for a more interactive setup with different workshop stations, giving participants a chance to explore various upcycling techniques at their own pace.

Suggestions for follow-up

- Organise a community upcycling event or swap meet.
- Organise an event to show all the creations and ideas.

Ideas for action

- Start a local upcycling club.
- Partner with schools or community centres to teach upcycling workshops.
- Organise a Swap Party in the community.
- Organise a movie night on the topic.

Other appendices

Final evaluation:

- **Google Forms or Microsoft Forms:** Both platforms are easy to use, free, and allow customisable templates with various question types (e.g. multiple choice, text responses, ratings).

Why this format?

- **Google Forms** allows for quick summarisation and visualisation of responses.
- **Microsoft Forms** integrates well with other Microsoft Office tools like Excel for deeper analysis.
- Both options allow exporting data for reports and sharing results easily.

Once the evaluation is created, share the link via email, social media, or a QR code to ensure broad participation.

Sample evaluation form is provided in Annex 1.

Useful resources

- Upcycle That (https://upcyclethat.com): A blog offering creative and practical upcycling ideas and projects, with tutorials on transforming waste into functional and artistic items.
- Zero Waste Home (https://zerowastehome.com): A resource for reducing waste, with tips and ideas on upcycling and repurposing everyday items.
- Etsy Upcycling (https://www.etsy.com/market/upcycling): A platform showcasing various upcycled products, offering inspiration for DIY upcycling projects.
- Recycle Coach: An app providing detailed information on recycling practices and tips for reducing waste, making it easier to understand what can be upcycled.
- Pinterest: A visual discovery app where users can find and save ideas for upcycling projects, DIY crafts, and sustainable living inspiration.

Books:

- "ReMake It: Recycling Projects from the Stuff You Usually Scrap" by Tiffany Threadgould – A hands-on guide to turning everyday trash into fun and functional projects.
- "Waste Not: Make a Big Difference by Throwing Away Less" by Erin Rhoads – Offers simple ideas and actionable tips for living a low-waste lifestyle, with a focus on upcycling and creative reuse.

Plastic Paradise – A documentary exploring the impact of plastic pollution and how creative reuse and upcycling can help address the waste problem.

10

Stop Motion

16 to 30 y

6 hours

Tackled problem: Lack of awareness about sustainable lifestyle choices and circular economy principles.

Key concepts	• Sustainable living • Circular economy • Stop motion animation
Aim and objectives	**Aim:** To educate participants about sustainable living and circular economy through the creation of stop motion videos. **Objectives:** • To raise awareness about the importance of reducing waste and reusing materials. • To teach basic stop motion animation techniques using a simple app on a phone. • To promote creativity in illustrating sustainable practices using recycled materials.
Group size	6 to 20 participants

Desired Outcomes

Competencies/skills:
- technical skills in creating stop motion animation.
- creative use of recycled materials.
- creativity in storytelling about sustainable practices.

Knowledge:
- Understanding of sustainable living practices and circular economy principles.

Attitudes:
- environmental consciousness
- appreciation for recycling and upcycling
- commitment to promoting sustainable choices and advocacy for sustainable living.

Materials and hand-outs needed

- Smartphones with a stop motion app installed (e.g. Stop Motion Studio, Clayframes)
- Recycled materials for props and characters (newspapers, cardboard, plastic bottles, etc.)
- Storyboarding templates and worksheets
- Handouts on sustainable living tips and circular economy principles
- Photos/examples of successful stop motion videos for inspiration
- Laptop and tools for editing (optional)
- Tripod for phones

Activity

Preparation and briefing (20 minutes)

Introduction (30 minutes)
Welcome and introduction to the workshop objectives.

Pre-Video brainstorming:

Before watching the video, engage the participants with a brief brainstorming session. Ask them:
- "What do you already know about sustainable living and waste reduction?"
- "What's your personal experience with recycling?"

Write their responses on a flipchart or whiteboard. This primes them for the video and activates prior knowledge.

Suggested videos:
- https://www.youtube.com/watch?v=zCRKvDyyHml
- https://www.youtube.com/watch?v=BiSYoeqb_VY
- https://youtu.be/H2bxO-PgcTO?si=mJFiL8NPZYOBwTIn

After the video, host a short reflection session. Use open-ended questions to encourage discussion:
- "What part of the video resonated with you?"
- "How could you implement circular economy practices in your own life?"
- "What role can creativity play in promoting sustainability?"

Group discussions: Divide participants into pairs or small groups to discuss their thoughts on the video, then have them share key points with the larger group.

Interactive activities:

Quick quiz: Before the video, use an online tool (e.g. Kahoot or Google Forms) to assess the participants' existing knowledge about waste and sustainability. This helps you gauge the group's baseline understanding.

Post-it: after the video, hand out sticky notes and ask participants to write down one key takeaway. Stick the notes on a board, review them as a group, and use the insights to guide a deeper conversation.

Mind mapping: Create a mind map on the topic "Sustainable Living" and ask participants to contribute ideas they saw in the video. Start with "Waste" in the center and expand outward with solutions for reducing waste through sustainable practices like upcycling.

Instructions and flow (2 hours 40 minutes)

Activity 1: Introduction to Stop Motion (30 minutes)

Explanation of Stop Motion Animation and Basic Principles:

1. What is stop motion?
   - Explain that stop motion is an animation technique where objects are moved in small increments between individual photographs. When played back rapidly, these photos create the illusion of movement.
2. Basic principles:
   - Frame Rate: Show how smooth animations rely on the number of frames per second (FPS). Demonstrate with a quick example, e.g. taking 10 frames for a second of animation.
   - Persistence of Vision: Explain how our brains perceive the sequence of images as fluid motion when they are shown rapidly.
   - Lighting and Stability: Stress the importance of stable lighting and camera positioning for consistent results.
3. Show videos and examples of simple Stop Motion Videos:
   https://www.youtube.com/watch?v=Xo2ioUYugMA
   https://www.youtube.com/watch?v=wVeZtnrmTiM

Demonstration of using a Stop Motion App:

1. Introduce the app:
   - Choose a free, easy-to-use app like Stop Motion Studio (available on Android and iOS).
   - Ensure all participants have downloaded the app on their phones before starting.
2. Hands-on demo:
   - Walk through the basic app functions:
     - How to set up the camera.
     - How to capture frames by taking pictures.
     - How to adjust the frame rate.
     - How to delete or duplicate frames.
3. Mini practice session:
   - Have the participants do a quick trial where they create a short animation (e.g. moving an object across a surface). This gives them an immediate hands-on understanding before moving on to the main project.

Activity 2: Storyboarding (60 minutes)

Storyboarding Basics:

1. Explain storyboarding:
   - A storyboard is a sequence of drawings or illustrations that outline the scenes in the animation.
   - Highlight the importance of planning the video before filming—breaking the story into manageable steps.
2. Provide storyboarding templates:
   - Distribute simple templates with boxes for sketches and space for notes (e.g. “Scene 1: Object X moves to Y”). Keep the template simple and visual so participants can sketch their ideas.

Brainstorm and Create Storyboards:

1. Group Division:
   - Divide participants into small groups (3-4 people each) and ensure they collaborate to brainstorm and decide on their stop-motion story.
     - By colours or symbols: hand out small coloured pieces of paper or cards with different symbols (e.g. stars, circles, triangles) as participants arrive. Each colour or symbol represents a group.
     - Counting: have participants count off by numbers (e.g. 1 to 4). All the "ones" form the first group, all the "twos" form the second, and so on.
     - Animal Sounds: assign each participant an animal name, like "cat," "dog," "bird," and have them find their group by making the sound of that animal (without talking).
     - Create groups ahead of time, either randomly or based on specific criteria (e.g. mixing introverts and extroverts, varying skill levels).
2. Incorporating sustainability themes:
   - Encourage groups to focus on themes like recycling, reducing waste, and reusing materials in their animation. Example story ideas:
     - The lifecycle of a plastic bottle from waste to being recycled.
     - How reusing items (e.g. making a new toy from old materials) helps the environment.
3. Keep it simple:
   - Remind participants to keep their stories straightforward, given time constraints. Emphasise short, manageable storylines—something that can be executed with their available materials and time.
4. Facilitator role:
   - Walk around the room and provide feedback on each group's storyboard. Ensure their ideas are

Activity 3: Production (120 minutes)

Gathering recycled materials:

1. Materials Available:
   - Provide a collection of recycled materials (e.g. cardboard, newspapers, bottle caps, old toys) for participants to use in their animations. Let them know they can also use their personal items.
2. Assign roles:
   - Encourage participants to divide roles within their group:
     - Set designers: arrange the backdrop and settings.
     - Character designers: create the characters from recycled items.
     - Animators: handle the actual filming.
     - Editors: edit the frames at the end of filming.

Filming the stop motion videos:

1. Set up the scene:
   - Have each group set up their stage for filming, ensuring proper lighting (use lamps if necessary).
   - Encourage groups to stabilise their phones using a tripod or other stable surface to prevent camera shake.
2. Begin filming:
   - Guide groups through taking frame-by-frame photos based on their storyboard.
   - Remind them to take small movements between each shot to ensure smoother animation.
3. Facilitator guidance:
   - Circulate among groups, offering help on:
     - Adjusting the frame rate to ensure proper speed.
     - Giving tips on how to ensure consistency in their characters' movements.
     - Offering feedback on the lighting and framing of shots.
4. Troubleshooting:
   - Help participants solve common issues, like:
     - Inconsistent lighting: Use stable light sources.
     - Unstable camera: Reinforce the use of tripods.
     - Missing frames: Remind them to save their progress regularly.

Activity 4: Editing and presentation (120 minutes)

Editing the stop motion videos:

1. In-App editing:
   - Use the stop motion app to arrange the photos in sequence, adjusting the frame rate and adding any special effects or transitions. Some apps allow basic editing like trimming frames or adding music.
   - If participants prefer, they can transfer their footage to laptops for more advanced editing (if they're comfortable).
2. Optional additions:
   - Encourage adding simple elements such as:
     - Text overlays to emphasise key sustainability messages.
     - Sound effects or music to make the videos more engaging.
3. Facilitator role:
   - Assist groups as needed with editing, particularly if they encounter technical difficulties with the app or software.
   - Offer creative suggestions for final touches, like adding a brief message at the end (e.g. "Reduce, Reuse, Recycle") or adding the participants' names.

Presentation of the Stop Motion Videos:

1. Group presentations:
   - Each group shows their video to the rest of the participants. Play the video using a projector or large screen for all to view.
2. Debriefing and feedback:
   - After each presentation, host a short feedback session:
     - Ask participants what they liked about the video.
     - Discuss the sustainability themes portrayed—how well were they incorporated?
     - Encourage constructive feedback, focusing on both the technical aspects (animation quality, creativity) and the message of sustainability.
3. Group reflection:
   - Pose questions like:
     - "What was the most challenging part of creating your stop motion?"
     - "How can stop motion videos be used as a tool for raising awareness about sustainability?"
     - "What other sustainable practices could you animate in the future?"

Debriefing (15 minutes)

Discussion and feedback session on the videos and sustainable messages.

Tips for facilitators

- Encourage creativity and experimentation with different materials.
- Provide technical assistance with the stop motion app and filming techniques. (for youth workers, familiarising themselves with the chosen app's guide is crucial for facilitating the activity effectively and supporting participants in mastering the stop motion animation process.)
- Foster collaboration and teamwork among participants.
- Be mindful of natural light: Since the stop motion process can be lengthy, natural light changes over time, which can affect the consistency of the animation. To avoid this, encourage participants to use a lamp for stable lighting and ensure it stays in the same position throughout the filming process. This will help maintain uniform lighting in their videos.

- **For smaller groups** (6–10 participants) facilitators can offer more personalised guidance during the storyboarding and production phases. Participants may have more time to refine their videos and explore more detailed or complex storytelling. You could also allow for more extended feedback and discussion sessions, giving each participant a chance to delve deeper into their creative process and sustainable themes.
- **For larger groups** (20+ participants) divide participants into smaller sub-groups (3–4 people per group) to ensure everyone has an active role in the stop motion creation process. Assign additional facilitators or volunteers to help manage each group, especially during the production and editing phases. In larger groups, you might streamline the feedback and discussion sessions by having participants share their videos in smaller breakout groups before presenting highlights to the entire group.

- **For a shorter duration** (e.g. 3–4 hours), condense the workshop by focusing on a simplified version of the stop motion project. You could reduce the time spent on storyboarding by providing participants with a pre-prepared storyboard and topic related to sustainability. This way, participants can jump straight into creating their animations without needing to brainstorm ideas. Have them create shorter animations (e.g. 10–20 seconds) to illustrate simple sustainable practices. Skip the detailed editing phase and focus on basic video assembly using the stop motion app. The final presentation could be a quick showcase of all the videos with brief feedback.
- **For a longer duration** (e.g. 8+ hours or a multi-day workshop): expand the workshop by allowing participants to develop more elaborate storyboards and longer animations. You can introduce advanced stop motion techniques such as lighting, sound effects, or the use of green screens. Participants could also collaborate on a larger group project, creating a cohesive series of stop motion videos that build on a central sustainability theme. The extra time allows for deeper reflection on the sustainable messages and more detailed video editing.

Suggestions for follow-up

- Create a compilation video of all participants' stop motion creations to share online.
- Organise a screening event to showcase the videos and raise awareness in the community.

Ideas for action

- Partner with schools to integrate similar workshops into environmental education programs.
- Collaborate with local organisations for a sustainable living campaign using participant videos.

Other appendices

Evaluation forms for participants' feedback on the workshop. See Annex 1 for a sample evaluation form.

Useful resources

Check other ideas and videos on Youtube and Pinterest, such as:

- https://www.youtube.com/watch?v=Xo2ioUYugMA
- https://www.youtube.com/watch?v=wVeZtnrmTiM

11

Revamp & Swap

16 to 30 y

3 hours

Tackled problem: Fast fashion waste and promoting sustainable fashion choices.

Key concepts	• Upcycling • Sustainable fashion • Clothing swap
Aim and objectives	**Aim:** To teach participants how to upcycle clothing and promote sustainable fashion through a clothing swap party. **Objectives:** • To raise awareness about the environmental impact of fast fashion and the benefits of sustainable fashion choices. • To encourage participants to exchange clothing items rather than discarding them. • To demonstrate practical upcycling techniques for clothing.
Group size	10 to 20 participants

Desired Outcomes

- Knowledge: understanding of sustainable fashion principles and the lifecycle of clothing.
- Competencies: practical skills in clothing alteration and upcycling techniques.
- Attitudes: appreciation for sustainable fashion practices and reduced consumption.

Materials and hand-outs needed

- Sewing supplies – needles, threads, scissors, pins, sewing machines (if available)
- Embellishments – patches, beads, fabric paints, etc.
- Clothing items for upcycling (participants can bring their own)
- Tables and racks for displaying swapped clothing items
- Handouts on upcycling techniques, sustainable fashion tips, and benefits of clothing swaps
- Photos/examples of successful upcycled clothing projects for inspiration

Activity

Preparation and briefing (20 minutes)

Welcome and introduction to upcycling.
Brief explanation of the importance of reducing waste.

- For the explanation, the facilitator can make use of engaging and visually appealing tools to help participants understand complex topics such as waste reduction, upcycling, and sustainability.
- A PowerPoint presentation provides a clear structure, can combine text with visuals, and is an effective way to present key concepts.

Brief Video about circular and linear economy, life cycle of an objects, impact of textile industry
- https://www.youtube.com/watch?v=zCRKvDyyHml
- https://www.youtube.com/watch?v=BiSYoeqb_VY
- https://youtu.be/H2bxO-PgcT0?si=mJFiL8NPZYOBwTln

The video content should not be just passive watching but rather integrated into the workshop with active engagement strategies.

Before Playing the Video:
Ask participants what they know about the environmental impact of waste. Write down their responses on a flipchart or whiteboard.
Pose questions like:
  - "What do you think happens to most of the waste we produce?"
  - "What are some ways you personally try to reduce waste?"

This pre-video brainstorming will engage the participants' prior knowledge and get them thinking about the topic before they see the video.

After the video:
Organise a short reflection session where you ask participants to share their thoughts. Use open questions like:
  - "What part of the video stood out to you the most?"
  - "How do you think the concept of a circular economy can help reduce waste?"
  - "What did you learn about the lifecycle of products and materials?"

For larger groups, divide participants into pairs or small groups to discuss the video and then share key points with the larger group. This promotes participation from everyone.

Other activities:
- Quiz: before the video, use a quick online poll (e.g. Google Forms, Kahoot) to ask participants about their current knowledge of waste and recycling. This will also help you gauge the group's understanding.
- Post-it: after the video, distribute sticky notes and ask participants to write down one key takeaway from the video. Stick the notes on a board and review them as a group to spark further discussion.
- Mind mapping: create a mind map where the participants add their ideas on how upcycling can reduce waste. Start with "Waste" in the centre and expand outward with solutions they saw in the

Instructions and flow (2 hours 40 minutes)

Step 1 - Demonstration of basic upcycling techniques:

1. Introduction to Upcycling Clothing:
   - Begin by explaining what upcycling is and its benefits for sustainability (extending the life of clothes, reducing waste, promoting creativity).
   - Highlight how upcycling differs from recycling, focusing on transforming and improving items instead of simply reusing them.
2. Demonstration of Key Techniques:
   - Choose 3–4 basic techniques to demonstrate:
     i. Hemming:
        - Show how to shorten pants, skirts, or sleeves to refresh a garment.
        - Provide a quick demonstration of hand-sewing or machine-sewing a hem.
     ii. Patching:
        - Teach participants how to cover holes or tears with patches.
        - Demonstrate both functional and decorative patching using fabric scraps or embroidered patches.
     iii. Embellishing:
        - Show how to add decorative elements like beads, buttons, fabric paint, or embroidery to enhance clothing.
        - Example: Adding embroidered designs or attaching lace trims to plain T-shirts or jeans.
     iv. Altering fit or shape:
        - Demonstrate simple ways to adjust a garment's size (e.g. taking in or letting out seams) or changing its shape (e.g. transforming a T-shirt into a tank top).
3. Provide examples and inspiration:
   - Bring visual examples of upcycled garments (either completed or work-in-progress) to inspire participants.
   - Share photos, slides, or mood boards of creative upcycling projects like turning jeans into bags or T-shirts into pillow covers.
   - Emphasise how even small changes can create entirely new looks.
4. Encourage creative thinking:
   - Ask participants to brainstorm different ways they could upcycle their own clothes. Have them think about what parts of the garment they like and what they want to change.

Step 2 - Hands-On upcycling (60 minutes)

Select a Clothing Item:

1. Choosing a garment:
   - Each participant selects a piece of clothing they brought from home or chooses from a selection provided by the facilitator (e.g. old T-shirts, jeans, jackets, scarves).
   - Encourage participants to choose something they feel attached to or think has potential for transformation.
2. Facilitators provide guidance:
   - Walk around and assist participants with the technical aspects of their projects. Offer:
     - Advice on choosing appropriate techniques based on the garment's fabric and style.
     - Hands-on help with basic sewing techniques or more complex alterations.
     - Creative ideas for using materials (e.g. using leftover fabric scraps for embellishments).
3. Emphasis on individual creativity:
   - Encourage participants to use their imagination and personalise their designs—this could include adding unique elements, using vibrant colours, or experimenting with textures.
   - Allow space for participants to experiment with materials. For example:
     - Fabric scraps from other projects.
     - Old ribbons, zippers, or buttons for embellishing.
     - Paint, stencils, or iron-on designs to add patterns or images.
4. Facilitator tips:
   - Offer some pre-made stencils or designs for participants who might need extra inspiration.
   - Encourage participants to collaborate and share ideas with others, fostering a sense of community.
5. Progress check:
   - Halfway through the activity, check on each participant's progress. Give feedback and encourage them to try new techniques or push their creative boundaries.

Step 3 - clothing swap party (60 mins)
Setting up the swap area:

1. Preparation:
   - Ask participants in advance to bring gently-used clothing that they no longer wear but would be happy to swap.
   - Set up tables or racks to display the clothing items neatly. Organise the space by category (e.g. tops, pants, accessories) for easy browsing.
   - Use mirrors and changing areas if available, so participants can try on items.
2. Facilitating the swap process:
   - Explain the rules of the clothing swap to ensure fairness and order. You can choose between:
     i. Token system:
        - Participants receive a token for each item they contribute (1 item = 1 token), which they can then use to "purchase" items from others.

     ii. Free exchange:
        - Alternatively, participants can browse freely and exchange clothing with no set rules, relying on trust and balance.
   - Set a limit on how many items each participant can swap at a time (e.g. up to 5 items per person) to ensure that everyone gets a chance.
3. Swap party:
   - Allow participants time to browse and select items they want. Make sure to create a fun, lively atmosphere with music, and encourage participants to interact and discuss their selections.
   - Facilitators should oversee the swap to ensure fairness and assist with any questions or issues (e.g. fitting, quality of items).
   - Encourage participants to explain the stories behind their items or why they're excited to swap, adding a personal element to the experience.

Step 4 - Closing and wrap-up:
Once the swapping concludes, invite participants to show off any upcycled or swapped items they are particularly proud of.

Debriefing

Ask participants to reflect on what they've learned or how they plan to continue upcycling in the future.

1. Reflection questions:
   - Facilitate a short discussion on the importance of sustainable fashion:
     - "How does upcycling or swapping contribute to reducing waste?"
     - "What did you learn about your own clothing choices through this process?"
     - "How can we apply the principles of upcycling to other areas of our lives?"
2. Optional follow-up:
   - Suggest organising future swap parties or upcycling workshops to keep the sustainability conversation going.
   - Share online platforms where participants can sell, swap, or donate unwanted clothes sustainably.

Tips for facilitators

Adapting for smaller/larger groups:

- For smaller groups, focus on personalised guidance and deeper exploration of upcycling techniques, encouraging participants to share ideas.
- In larger groups, divide participants into smaller teams, rotating through activities, and ensure additional facilitators manage the flow and provide support. Set up multiple swap areas to avoid overcrowding.

Adapting for shorter/longer duration:

- For shorter workshops, combine the demo with hands-on activities, focus on simple techniques, and shorten the swap party. Provide resources for continued learning.
- For longer sessions, add advanced upcycling techniques, invite guest speakers, and include more in-depth activities, such as styling swapped items or group discussions.

Suggestions for follow-up

- Organise a community upcycling event or swap meet.

Ideas for action

- Partner with local thrift stores or community organisations for future swap events.
- Collaborate with fashion schools or sustainable fashion advocates to expand outreach.
- Organise a Swap Party in the community.
- Organise a movie night on the topic.

Other appendices

Evaluation forms for participants' feedback on the workshop. See Annex 1 for a sample evaluation form.

Useful resources

- Fashion Revolution (https://www.fashionrevolution.org): Global movement promoting sustainable fashion with resources on upcycling, ethical fashion brands, and educational materials.
- Good On You (https://goodonyou.eco): Platform that rates fashion brands on their sustainability and ethical practices, offering tips on making conscious fashion choices.
- Depop: A popular app for buying, selling, and swapping second-hand and upcycled clothing.
- Good On You: An app version of the website, helping users find sustainable fashion brands and make ethical purchasing decisions.
- "Fashionopolis: The Price of Fast Fashion and the Future of Clothes" by Dana Thomas – A deep dive into the impact of the fashion industry and the rise of sustainable alternatives.
- "Overdressed: The Shockingly High Cost of Cheap Fashion" by Elizabeth L. Cline – A book exposing the dark side of fast fashion and exploring ways to embrace sustainable fashion choices.
- The True Cost (available on Netflix) – A documentary exploring the impact of fast fashion on people and the planet.
- RiverBlue (available on Amazon Prime) – Investigates how the fashion industry contributes to water pollution and highlights sustainable alternatives.

14 to 35 y

12 Turning Food Waste into Colour

3 hours

Tackled problem: This workshop addresses the environmental impact of synthetic dyes on the fashion industry and introduces participants to eco-friendly alternatives using food waste. The workshop focuses on reducing waste, promoting sustainable practices, and fostering creativity through natural fabric dyeing.

Key concepts	• Natural dyes and their environmental benefits • Circular Economy • Reducing food waste • Basic fabric dyeing techniques • Creativity and resourcefulness in sustainability
Aim and objectives	**Aim:** To introduce participants to the concept of using natural dyes derived from food waste for fabric dyeing and to raise awareness about sustainable fashion. **Objectives:** • Educate participants on the environmental impact of synthetic dyes. • Demonstrate how to create natural dyes from common food waste (e.g. onion skins, avocado pits, beet peels). • Teach basic dyeing techniques and how to apply them to fabrics. • Encourage participants to think creatively about sustainability and reducing waste in everyday life.
Group size	6 to 10 participants

Desired Outcomes

Knowledge:
- environmental impact of synthetic dyes
- natural dyeing processes and how food waste can be repurposed.

Skills: natural dye extraction, fabric dyeing techniques

Attitudes:
- Eco-conscious mindset towards fashion and waste reduction.
- Understanding the link between circular economy practices and sustainability.
- Creativity in sustainability
- Commitment to waste reduction.

Materials and hand-outs needed

Materials:

- Food waste items for dyeing (onion skins, avocado pits, beet peels, etc.)
- Fabric pieces (cotton, linen, or silk)
- Large pots for boiling
- Strainers
- Rubber gloves
- Tongs
- Dye containers or buckets
- Spoons for stirring
- Protective aprons or old clothes for participants
- Towels for drying dyed fabrics
- Safety goggles (optional)

Hand-outs:

- Natural Dye Recipe Sheets (PDF with step-by-step instructions)
- Sustainable Fashion Tips
- Circular Economy and Food Waste Reduction Info Sheet
- (Handouts can be customised with photos and instructions specific to the workshop.)

Activity

Preparation and briefing (30 minutes)

- Begin by welcoming participants and briefly outlining the workshop objectives, emphasizing how it aims to raise awareness about sustainable fashion practices.

- Introduce participants to the environmental impact of fast fashion and the harmful effects of synthetic dyes. Use visually engaging tools like a PowerPoint presentation to illustrate the high environmental cost of these processes. Highlight natural dyes as an eco-friendly alternative, explaining how they offer a sustainable way to bring color to fabrics without causing harm to the environment.

- Explain the concept of the circular economy, focusing on how it contrasts with the traditional linear economy by promoting the repurposing of waste materials. Discuss the connection between circular economy principles and food waste, particularly how food waste can be transformed into natural dyes, supporting sustainability.

- To reinforce these ideas, share a few short videos:

https://www.youtube.com/watch?v=SrmF-Bsmi7Q (only ITA)
https://www.youtube.com/watch?v=VnlvzIf0LIk&t=33s
https://www.youtube.com/watch?v=tLfNUD0-8ts
https://www.youtube.com/watch?v=zpMlO7zBaAI

- Before playing the videos, engage participants by asking:
  - "What do you know about the environmental impact of synthetic dyes?"
  - "How often do you consider the sustainability of the clothes you buy?"

Write their responses on a flipchart or whiteboard to create a starting point for reflection.

- After watching the videos, facilitate a brief reflection session with open-ended questions like:
  - "What information in the videos surprised you the most?"
  - "How could natural dyes reduce the environmental impact of the fashion industry?"

To foster a more interactive discussion, have participants share their thoughts in small groups before summariaing key insights as a whole group.

This structure will actively engage participants, encouraging them to reflect on their existing knowledge and become open to the sustainable alternatives discussed in the workshop.

Instructions and flow (1 hour 45 minutes)

Step 1 - Introduction to natural dyes:

- Overview: Begin by explaining the concept of natural dyeing and its benefits as a sustainable alternative to synthetic dyes. Highlight how natural dyes can be extracted from common household food waste, reducing waste while creating vibrant, eco-friendly colours.
- Materials: display the materials you'll be using for the dye demonstration. Encourage participants to consider using seasonal, local, and organic vegetables and fruits, such as:
  - Onion skins (yellow-brown)
  - Avocado pits and skins (pale pink)
  - Beet peels (red or magenta)
  - Turmeric (bright yellow)
  - Spinach (green)
  - Red cabbage (purple/blue)
  - Carrots for orange
  - Blueberries for blue
  - Pumpkin for yellow-orange
  - Cherries for red

Emphasise that using seasonal and local produce not only supports sustainable agriculture but also reduces the carbon footprint associated with transportation.

Step-by-Step dye preparation process:

1. Gather ingredients:
   - Explain that most dyes can be made using kitchen scraps, like onion skins, beetroot peels, or avocado pits. Emphasise using natural, non-toxic materials to avoid harm to the environment or skin.
2. Boiling the ingredients:
   - Onion skins example:
     - Place onion skins in a large pot.
     - Cover with water (about twice the volume of the skins).
     - Boil the mixture for about 30–45 minutes, then lower the heat and let it simmer.
     - The longer it simmers, the more intense the dye colour becomes.
     - After simmering, strain out the solids using a mesh strainer or cloth.
3. Soaking process:
   - After straining, explain that the dye is ready to be used for soaking fabrics. The length of time the fabric is soaked will affect the intensity of the colour:
     - For lighter colours, soak for 20–30 minutes.
     - For deeper, richer colours, you can soak for a few hours or even overnight.
   - Encourage participants to experiment with timing and different materials to achieve various shades.
4. Using a mordant (Optional):
   - Explain that mordants (fixatives like salt or vinegar) help the dye adhere to the fabric and make the colours last longer.
   - For plant-based dyes, you can use vinegar (for plant fibres) or alum or salt (for protein fibres like wool or silk).
   - Provide instructions on how to prepare a simple mordant solution (e.g. vinegar and water in a 1:4 ratio).
5. Safety precautions:
   - While natural dyes are generally safe, caution should still be taken:
     - Use gloves to avoid staining hands.
     - Work in a well-ventilated area.
     - Avoid consuming the dyed materials and always use separate utensils for dyeing (not the ones used for cooking).

Incorporating second-hand clothing:

- Sustainable fashion mindset:
  - Discuss the importance of upcycling second-hand clothing rather than purchasing new items. Encourage participants to think creatively about how they can transform and personalise pre-loved garments.
  - Suggest that participants consider designs that they will genuinely use and enjoy, thus preventing waste and reducing the demand for new clothing.
- Design ideas:
  - Encourage brainstorming for practical and stylish designs:
    - Transforming a plain t-shirt into a fashionable tote bag.
    - Upcycling old jeans into stylish patches for a jacket.
    - Adding a unique dye pattern to enhance the look of a thrifted item.
  - Remind participants that each upcycled piece tells a story and contributes to a more sustainable wardrobe.

Debriefing (30 minutes)

Invite participants to share their dyed fabric creations and discuss their experiences with the natural dyeing process. Encourage them to reflect on how their understanding of sustainable fashion has evolved through this hands-on activity.

Guided reflection questions
Facilitate a group discussion with questions designed to help participants connect the workshop content with their personal choices and future actions:

- "What insights did you gain about the impact of synthetic dyes versus natural dyes?"
- "How can using natural dyes contribute to a more sustainable fashion industry?"
- "What changes might you consider making in your clothing purchases or habits after this experience?"
- "How do you see yourself applying the concepts of circular economy and waste reduction in other areas of your life?"

Tips for facilitators

- For smaller groups, provide more individualised guidance during the dyeing process.
- For larger groups, create smaller working teams to ensure everyone has a chance to participate.

- For shorter sessions, prepare the dyes in advance and focus on the fabric dyeing and reflection stages.
- For longer sessions, incorporate additional techniques like screen printing with natural dyes or creating patterns with resist methods (e.g. using wax or stencils) or a documentary about the impact of food waste or fast fashion.

- In smaller spaces, use portable stoves or microwaves for dye preparation.
- For larger or permanent spaces, set up designated dyeing stations to allow for smoother transitions between activities.

Suggestions for follow-up

- Encourage participants to experiment with more natural dye sources (e.g. herbs, flowers, spices) at home.
- Organise a follow-up session on creating eco-friendly, naturally dyed fashion items like tote bags, scarves, or wall hangings.
- Collaborate with local artists or designers who focus on sustainable fashion for an advanced workshop.

Ideas for action

- Start a community project to collect food waste from local markets or cafes for dyeing purposes.
- Promote awareness of sustainable fashion through local exhibitions or fashion shows featuring naturally dyed fabrics.
- Create an online group where participants can share their projects and exchange tips on natural dyeing and sustainable living.

Other appendices

Final evaluation:
Google Forms or Microsoft Forms: Both platforms are easy to use, free, and allow customisable templates with various question types (e.g. multiple choice, text responses, ratings).

Why this format?
- Google Forms allows for quick summarisation and visualisation of responses.
- Microsoft Forms integrates well with other Microsoft Office tools like Excel for deeper analysis.
- Both options allow exporting data for reports and sharing results easily.

Once the evaluation is created, share the link via email, social media, or a QR code to ensure broad participation.

See Annex 1 for a sample evaluation form.

Useful resources

- Explore online videos based on the specific dyeing techniques you're interested in. Platforms like YouTube, Pinterest, and Domestika offer great ideas and courses. For inspiration, you can start with videos like https://www.youtube.com/watch?v=LEvQBlvhhg0

DOCUMENTARIES:

- "The True Cost" (2015)
  - Overview: This documentary exposes the harsh realities of the fast fashion industry, including its environmental devastation and the exploitation of garment workers.
  - Why Watch: It provides a comprehensive look at how consumer choices impact the environment and people, making it an eye-opener for those interested in ethical fashion.
- "RiverBlue" (2017)
  - Overview: This film follows the destruction caused by the fashion industry on rivers worldwide and calls for sustainable change.
  - Why Watch: It highlights the impact of dyeing and textile processes on water pollution, reinforcing the importance of natural dyeing alternatives.
- "Minimalism: A Documentary About the Important Things" (2016)
  - Overview: While not exclusively about fashion, this documentary explores the benefits of a minimalist lifestyle, including how it can apply to clothing.
  - Why Watch: It encourages viewers to rethink consumerism and consider reducing their wardrobes as a step toward sustainability.
- "The Next Black" (2014)
  - Overview: This documentary explores the future of clothing, focusing on innovators pushing for sustainable and high-tech alternatives in fashion.
  - Why Watch: It offers a look at how technology and sustainability can intersect in the fashion world, with insights into alternative fabrics and processes.
- "Fashion's Dirty Secrets" (2018)
  - Overview: Investigative journalist Stacey Dooley uncovers the dark side of the fashion industry, including the water consumption and pollution it causes.
  - Why Watch: This film is especially powerful for its focus on how fashion impacts specific communities and environments, driving home the global consequences of fashion choices.
- "Slowing Down Fast Fashion" (2016)
  - Overview: Actor Alex James explores the world of fast fashion and its impact on the environment, advocating for a more sustainable approach to clothing.
  - Why Watch: It's a great introduction for those new to the topic, providing practical tips on how to shop and live more sustainably.
- "Unravel" (2012)
  - Overview: A short documentary that follows garment recyclers in India who process clothes discarded by the Western world.
  - Why Watch: It provides a unique perspective on the life cycle of clothing and how second-hand clothes from the West impact other parts of the world.
- "Made in Bangladesh" (2019)
  - Overview: A fictional film based on real events, focusing on a young garment worker in Bangladesh who fights for her rights and those of her fellow workers.
  - Why Watch: While it's not a documentary, it offers a compelling portrayal of the garment workers behind the clothes we wear, putting a human face on the issues in the fashion industry.
- "The Green Lie" (2018)
  - Overview: This documentary examines greenwashing, with a section on how the fashion industry falsely markets itself as sustainable.
  - Why Watch: It's an insightful watch for understanding how to discern genuine sustainability efforts from marketing tactics.
- "A Plastic Ocean" (2016)
  - Overview: Although not directly about fashion, this documentary highlights the massive issue of plastic pollution, much of which is driven by synthetic fibers in clothing.
  - Why Watch: It raises awareness of the impact of microplastics from synthetic fabrics, connecting fashion to broader environmental concerns.

RESPONSIBLE AND SUSTAINABLE CONSUMPTION

from 16 y

13 What are our clothes like?

45 minutes

Tackled problem: This dynamic attempts to delve deeper into the different production models of the clothing we buy, through the information we receive from the product label and other sources on the Internet. It is a way to learn basic tools to analyse the aspects that come into play in consumption critically.

Key concepts	• Learn basic tools to analyse the aspects that come into play in consumption critically
Aim and objectives	• To understand the elements that make up the clothes we buy and wear. • To learn about the cycle of manufacturing and the origin of these clothes. • Investigate the working conditions of the people who make them.
Group size	25 participants

Desired Outcomes

- Participants have reflected on the use we make of our clothes reinforcing the importance in this context of the circular economy.
- Critical awareness to support recycling actions in everyday life.

Materials and hand-outs needed

- Three different 100 % cotton t-shirts, with their corresponding labels:
  - one is a well-known brand
  - the other is unbranded (cheap trade) and
  - another is fair trade.

- Each group has a mobile phone to do a research on each T-shirt.
- Each group has post-it, coloured pencils, and paper of different formats, to make notes and/or drawings within the framework of the research.
- A large piece of paper and coloured pencils are available for the session for the final discussion.

Activity

Preparation and briefing

- The group is divided into research subgroups.
- One type of T-shirt per group will be raffled.

Instructions and flow

- Each group presents its research work by answering the following 6 questions:
  - What is the estimated price of the T-shirt?
  - In what kind of shops can we find them?
  - Where did the cotton used to make it come from?
  - Under what working conditions was the cotton grown?
  - Where and under what working conditions was this T-shirt made?
  - How much could a worker have been paid to make it?
- To do this, paper and pencils will be used so that everyone can write down the elements of the T-shirt and make a map of the reality of the T-shirt.
- The results of the research are shared. One person from each group tells the results of the research, presenting their T-shirt and all the background information created around it (drawings, annotations, etc.). The result is posted on the wall.
- During the discussion, the workshop leader gives thematic information based on the research results.

With all the T-shirts and the background of each research (papers, drawings, etc.) on the wall, a small discussion is organised in which the advantages and disadvantages of each of the T-shirts are evaluated. The guide writes these down on two columns of a large piece of paper. He or she asks the following questions to trigger the discussion:

-What information about the product does the label not reflect?
-Why is information omitted from the label, and does this have any implications for the consumer?
-Is it easy for the consumer to know which people and from which countries have been involved in which product?
If the fair trade T-shirt is fairer, why don't we always buy fair trade products?

Debriefing

The workshop is closed, and the guide gives brief conclusions about the workshop.

Tips for facilitators

- Provide t-shirts from different countries and realities
- Provide internet connection and furniture
- Provide the materials associated with the research and the general session, such as paper, pencils, markers, post-it notes and others.

Suggestions for follow-up

- Make an exhibition that remains permanent.

14

Domino Effect

secondary school

50 minutes

Tackled problem: A dynamic and participatory game that will help us to learn about and better understand the complex issues surrounding anthropogenic climate change, analysing its main causes and consequences and reflecting on possible solutions.

Key concepts	The purpose of the game is to collectively build a visual concept map of climate change that helps students to better understand this complex and synergistic phenomenon, analysing it from its physical origins to its possible solutions, including its main socio-economic causes and socio-environmental consequences.
Aim and objectives	• To understand the complex web of relationships that exist around climate change. • To understand the scope of climate change, discerning between its main causes and consequences. • To outline, reflect on and discuss options for responding to climate change, as well as possible solutions.
Group size	10 to 20 participants

Desired Outcomes

- Participants have gained education in civic and ethical values, environmental science.
- Participants have understood the complexity of sustainability based on a critical and honest analysis of all the environmental, social and economic implications.
  - 4.2 assuming the complexity of sustainability
  - 4.2.3 contextualisation of the problems

Materials and hand-outs needed

- Game cards (30)
- Pieces of string to connect the different cards.
- White paper sheets or cards.
- A space of about 25 square metres free of objects.

Activity

Preparation and briefing

- To start the game, explain what the game is about and its dynamics. Explain the different elements and cards that compose it.
- The set consists of 30 double-sided cards. The front of each card has a title and an image related to climate change. The reverse side again has the title and a short explanatory text.
- The cards are divided into three groups:
  - Blue cards, of physical processes related to climate change (3).
  - Green cards, with the main anthropogenic causes behind climate change (9).
  - The red cards, with some of the main consequences of climate change (18).

Instructions and flow

1. To start the game, read and explain aloud the card "Natural Greenhouse Effect" (blue card), then place it on the floor approximately in the centre of the space for the activity.

2. Next, distribute the rest of the cards among the students and ask them to identify those that correspond to human activities that are generating an increase of greenhouse gases in the atmosphere (causes, green cards).

3. Once they have identified all of them, ask them to place them in branches on top of the "Natural greenhouse effect" card, connecting them to it by means of pieces of string of different lengths, which will represent the greater or lesser contribution of each of these causes to the increase of the greenhouse effect.

4. At this point, read aloud all the connected cards, reflecting collectively on the different anthropogenic actions that are generating the increase of the greenhouse effect on Earth which, in turn, is contributing to increase the average global temperature of the planet.

5. Then place the two remaining blue cards on the floor (the "Increase in the greenhouse effect" and then the "Global warming" card), reading and explaining them aloud and connecting them successively with strings under the "Natural greenhouse effect" card.

6. Next, hand out to the students the rest of the cards (the red cards, with the consequences of climate change), so that they can read them and place them under the "Global Warming" card, connecting them to it by means of pieces of string of different lengths, in this case, the greater or lesser severity of each one of the consequences.

7. In addition, and depending on their main effects, the facilitator can propose to the students to connect the consequence cards with pieces of string around three large differentiated groups: environmental consequences, social consequences and economic consequences.

Debriefing

Once we have finished the plot of the main causes and consequences of climate change, with all the cards laid out on the floor and all the connections agreed upon and captured with pieces of string, the game will enter its last phase: the proposal phase. To do this, distribute among the participating individuals or teams several blank cards or sheets of paper, and ask them to think of possible solutions or response actions that we could carry out in order to mitigate and adapt to climate change.

To encourage debate and brainstorming, ask students the following questions out loud:

- What could governments do about the problem of climate change?
- What could science do?
- What could the education system do?
- What could citizens do?
- What could you do in your day-to-day life about climate change?

Tips for facilitators

- It is advisable to do it with small groups to properly guide

Ideas for action

It is important to emphasise that there is no single solution to this game, as it represents a complex environmental problem that is part of a dynamic system. The object of learning, therefore, is not so much the final product as the deliberative, participatory and consensual process that leads to it.

Other appendices

Some concrete ideas that could come up in the debate are:

- Reduce greenhouse gas emissions through international political agreements.
- Reduce the use of oil, gas and coal.
- Implement technological improvements that enable more efficient use of energy.
- Increase investment in renewable energy.
- Encourage the reuse and recycling of objects and materials.
- Increase scientific research on anthropogenic climate change and develop risk maps.
- Restrict deforestation and control the artificialisation of land.
- Increase forest area to increase carbon sequestration.
- Protect natural ecosystems and improve nature conservation policies.
- Change our development model (the production and consumption model).
- Reduce overall material and energy consumption.
- Restrict air travel and the use of private motorised transport.
- Fight and legislate against planned obsolescence.
- Promote less meat-consuming eating habits based on seasonal and local vegetable products.
- Plan measures to anticipate and compensate for damage linked to extreme weather events.
- Plan forest fire prevention and response actions.
- Improve education, communication and public awareness on climate change to better inform objectively about the problem and act accordingly.
- Promote citizen participation to encourage a change in the current (predominantly polluting and wasteful) lifestyle.

Useful resources

- https://tiempodeactuar.es/

15

Upcycling

8 to 18 y

60 minutes

Tackled problem: Everything we throw away can be reused. Although we believe that they are waste, we can give them other functions according to our needs.

Key concepts	• Upcycling • Reuse • Creations
Aim and objectives	This dynamic aims to make own creation using upcycling. Participants will: • learn to know the different uses that materials that we consider single use can have; • discover new uses for materials that we think only have one or are disposable, reusing them from the perspective of reuse and reducing consumption; • improve their creativity when it comes to giving a second chance to the materials that we will recycle, giving them a new use, different from the one they initially had; • learn to create environmentally friendly resources, from the perspective of recycling.
Group size	4 to 20 participants

Desired Outcomes

- The participants value sustainability.
- The participants have improved their:
  - systems thinking;
  - adaptability;
  - individual initiative.
- The acquired skills refer to area 3 and specifically to skills 3.1 and 3.2 of the GreenComp.

Materials and hand-outs needed

- Video of the activity: https://www.youtube.com/watch?v=FqmTe3ysxu8
- 5 2-litre plastic bottles per participant
- A pair of pliers
- 5 metres of wire
- 1 thick black marker
- A computer and a printer for the legends and the QR

Activity

Preparation and briefing

The imagination is essential to get the most out of upcycling.
We going to give a second life to what we are going to throw away, with a different shape than the original product or even improving it with used products of the students.

Some ideas to make compositions are:

- We can use canned goods to make vases, baskets, pencil holders, or toys.
- Clothes that are no longer used can be used to make mosaics or storage bag objects. We can make decorative figures, jewelry, or flowers, with plastic bottles.

In our activity we are going to focus on the construction of litter bins with recycled material, in this case, with plastic bottles.
With this idea we will generate a circular process in which we will use recycled material to build a material that allows us to continue recycling.

Instructions and flow

Session 1. Awareness raising (60 minutes)

- In this first session, work on everything related to recycling. Do this by asking questions that encourage a group debate.
- Separate the group into 5 groups of 5 participants each and ask them the following questions:
  - For what and why recycle?
  - What impact do we think recycling has at a global level and at a local level?
  - What everyday items can we recycle?
  - What do we need to recycle?
  - What do we think is done with the material that is recycled at an industrial level? Cans, glass, paper.
  - What is our role within this entire process?
  - What materials do we recycle, as we do in our environment? Home, school, work.
  - What could we build or manufacture ourselves with those materials?

These questions will be worked on in small groups and each of the answers will be presented in a large group, generating a debate to agree on the reasons and respond to the questions raised.

It would be interesting to collect the agreements in a panel that allows us to view and remember them.

Once the dynamic is finished, make a concrete activity proposal – to manufacture recycled bins for recycling.

- First, show to the participants the following video https://www.youtube.com/watch?v=1skPkyiln2s
- Ask the participants to bring the following material to the next session:
  - several 2-litre plastic bottles with caps.

Session 2. Making recycling containers to use in the classroom (60 minutes)

For this second session, we need all students to have brought the material requested in the previous session.

- Reread the panel prepared in the previous session and watch the construction video again, clarifying and resolving any possible doubts.

- Subsequently, each group will have to make a container for a specific recycling.

Group 1. Paper recycling.
Group 2. Cardboard recycling.
Group 3. Packaging recycling.
Group 4. Recycling of cans.
Group 5. Glass recycling

Each container may have a different size and design in terms of shape, but they will all have common elements.

The task is to make garbage containers for recycling using recycled plastic bottles. These containers may be for paper, cardboard, cans and glass. In this way, while we do the work of direct recycling by giving the material a second use, we will be able to address continuous elements with the packaging recycling process.
The specific development of the activity can be seen in this video:

- https://www.youtube.com/watch?v=1skPkyiln2s

- The containers will have elements identifying their use and since they are elements shared by the large group, we collectively say the colour of each of the containers.
- Once this question has been resolved, each group will make the container and paint it the assigned color.
- Each container will have its own color, so they will have to be painted in the chosen color.
- Later, the name of the recycled material for which it has been designed will be painted (example: glass container sign).

Session 3. Creating the legend (60 minutes)

The third and last session will be dedicated to providing explanatory content to the containers made. With this we will be able to spread the work.

- Firstly, and working in a large group, create a QR code where the explanatory video of the manufacturing can be viewed. Later, each group will place it in a visible place.
- Secondly, each group will prepare an explanatory legend on how to recycle each of the elements indicated in session 2. As an example, the group in charge of glass will have to design a typical poster in which it will indicate how to recycle the glass (without liquid, it is deposited and not thrown away to avoid cuts, etc.). This legend will also indicate the subsequent use that this glass will have once it is recycled and that was already worked on in session 1. The collection times will also be indicated and the people responsible for it will be chosen.
- Once made and attached to the container, each small group will make a presentation to the large group of their container, legend and procedure for use.

Debriefing

We have just created recycling containers with recycled elements, which in turn allow the elements placed in them to be recycled again. This will be the element that should initiate reflection and debate.

- Are the materials really perishable?
- How many uses do the materials have?
- Is it necessary to continue using and throwing away?
- What can we think of doing with the materials that are deposited in our containers?
- How much impact have we had? That is, how many bottles have we given a double life? How many industrial recycling containers have we saved from having?

Tips for facilitators

- For small groups, the activity can be planned individually. In the case of larger groups, several persons can work together.
- The duration of the dynamic can be modified by the difficulty of the creations.
- Any space can be adapted to carry out the activity depending on the number of students.

Suggestions for follow-up

The creations could later be sold at a charity market whose funds would go to an environmental association.

Ideas for action

- Organise a charity market
- Tutorials could be recorded on how to make creations with used objects.

16

Message in the Bottle

16 to 18 y

10 hours in 5 sessions

Tackled problem: A learning experience for the generation of devices that have an impact on our city and connect with citizen initiatives.

Key concepts	Concepts such as DYS or DIWO (Do it yourself – Do it with others), serve to realise collective problem-solving strategies. In this case, based on sustainability, recycling, and energy uses. Working with these concepts involves generating a collective intelligence that enhances common knowledge and learning about issues that we want to address together, both socially and culturally.
Aim and objectives	• To learn, through practical exercise, how to make artistic pieces with recycled materials. • Acquire techniques and skills in the construction of a large-scale object. • To learn about the different uses that can be given to elements associated with sustainability. • To build collective knowledge from a collaborative symbolic narrative.
Group size	10 to 20 participants

Desired Outcomes

- Raised awareness of the use of materials in artistic creation.
- Participants have learned the importance of these materials for the message they want to deliver about recycling.
- Collective work where ideas are negotiated and a common result is obtained, where each participant has a role, has helped to reinforce the idea that together we can tackle the problems of climate change.
- The participants know how to deliver a clear, direct, and aesthetically pleasing message about the problem being addressed.

Materials and hand-outs needed

For the writing workshop:
- Printing of texts to be read, coloured pencils and post-it notes

For the preparation of bottle lamps:
- Recycled plastic bottles with lids, which will be collected by the educational community
- Coloured spray
- Self-contained drills
- Painter's tape
- Plastic ties

For the photovoltaic circuit:
- LED bulbs and cables
- Basic circuit of a transformer and battery programming panel
- 3 sets of electric soldering iron
- Wire stripper pliers
- Tensioners Clemas
- Tape screwdrivers

For the vertical garden:
- Pots and cuttings

Activity

Preparation and briefing

A large-format piece will be created based on a word or text linked to climate change. This text is made up of bottles, which are illuminated with photovoltaic energy. The structure that holds the bottles will be made by the activity guides. On the back of the text/structure, a vertical garden is installed. This piece functions as an installation that intervenes in the public space and will be placed in the courtyard of the educational centre.

The workshop guides will carry out a campaign within and outside the educational community to collect plastic bottles with lids, which will be the main material in the construction of the piece. This campaign involves explaining the project to the educational community and disseminating it. Each workshop participant will have the role of collecting the collected bottles when the construction starts.

Instructions and flow

Writing workshop: the aim of the workshop is explained around the final outcome, which is to find the word or phrase that will be created collectively.
In the session, various texts on climate change and its consequences are read, and each participant underlines a phrase or word that motivates them. This word is written on a piece of paper. Then all the words and phrases are put together on the wall, and in a negotiation exercise, the final phrase to be used is created and selected together.

Laboratory for making bottle lamps: Participants gather the bottles collected in the campaign and make sure that each bottle has a lid. Each participant cleans the bottles and then spray paints half of the bottles.
With all the bottles painted, the participants drill holes in the lids and the body of each bottle for the construction of the subsequent electrical circuits.

Photovoltaic energy: In these sessions we will work on generating a circuit with LED lamps that connects each bottle to a series circuit. This circuit will illuminate the text built with the bottles. To do this, the practical way of making the circuit with the LED devices will be explained and each participant will make a series of them until the total required is reached.
The assembly and connection with the photovoltaic system created will be carried out, which will be installed to operate the lamps by means of a self-consumption circuit to illuminate the text.

Vertical garden: Once the structure has been created by the workshop guides, and the bottles and circuits have been installed, a vertical garden is developed on the back of the poster. The group gathers a series of pots and cuttings provided by the educational community and instals them on the back of the text.

Final installation: The piece is finished when it is illuminated. All participants witness and are part of the final result, making the piece work.

Debriefing

The facilitator concludes the activity with a set of questions:

- What did you learn today?
- Was there something surprising about this activity?
- Can you use the knowledge acquired through this activity in real life?
- What could be improved?

Ideas for action

- Make an exhibition of the pieces made to raise awareness.

GREEN ENTREPRENEURSHIP

17

IKIGAI in Search of Purpose

students (can be adapted to younger people)

1.5 hours

Tackled problem: Definition of life purpose, self-knowledge for the definition of sustainable business ideas.

Key concepts	• Self-knowledge • Critical thinking
Aim and objectives	• To promote self-knowledge in young people and the importance of this with the development of entrepreneurial ideas. • Linking the importance of the search for personal purpose with the development of impactful business models.
Group size	10 to 20 participants

Desired Outcomes

- Self-awareness
- Communication and assertive listening
- Critical thinking
- Creativity

Materials and hand-outs needed

- Printed or projected figures
- Artistic materials
- Coloured post-it
- Music and player
- Audio-visual equipment
- Reusable cardboard
- Reusable sheets of paper
- Pens and pencils
- Mobile phones, tablets, computers

Activity

Preparation and briefing

Give a brief explanation of the concept of IKIGAI and the search for life purpose. We can use the following conceptual elements:

The term IKIGAI comes from Japanese. It is composed of two words: "IKI" (LIFE) and "GAI" (VALUE). IKIGAI represents finding the reason for being, the meaning of life. It is about finding our purpose in life, a reason to get up every morning.

Finding our purpose helps us to give meaning to our lives, and contributes significantly to our overall happiness and well-being. It also gives us the ability to face life's challenges with determination and resilience. It is a personal and profound journey that can transform the way we live and experience the world.

Finding the IKIGAI is a matter of analysing four fundamental areas, the first two related to the personal level and the last two to the analysis of the context:

- WHAT YOU LOVE
- WHAT YOU DO WELL
- WHAT THE WORLD NEEDS
- WHAT YOU COULD BE PAID FOR

When these four elements combine in harmony, it is said that you have found your IKIGAI. In other words, the IKIGAI is the point where passions, vocations, mission and profession converge, creating a deep sense of purpose. Finding and living according to your IKIGAI is considered fundamental to a full and meaningful life. This has a direct impact on decision making and the pursuit of a professional project.

Relationship of IKIGAI and the search for purpose with entrepreneurship:

- Focus: A clear purpose gives us direction and focus. It helps us set goals and make decisions aligned with our objectives.
- Motivation and Passion: Having a purpose motivates us. By doing something that really matters to us, we find an inexhaustible source of energy and passion, which drives us to overcome obstacles and challenges. **This is very necessary to know how to overcome the challenges of entrepreneurship.**
- Mental and Emotional Wellbeing: Knowing why we get up in the morning and having a sense of meaning in what we do is directly related to better mental and emotional health. Purposeful people tend to experience higher levels of emotional well-being.

Instructions and flow

This is an activity that is divided into 4 blocks and requires analysing key questions in each of them. It is an activity where students will analyse questions that allow them to make an inner connection to search for key aspects that allow them to discover and define their qualities, skills and motivations.

For the activity to run smoothly, it is necessary to indicate to the participants that the idea behind the questions in each block is to think and feel the possible answers, i.e. it cannot be just any answer, it is necessary to make a reflection to find in all the blocks the aspects that most resonate with them.

Each of the blocks, with the exception of number two, is developed individually, using artistic resources that facilitate the expression of ideas, feelings and beliefs.

Before starting, give the group a figure similar to the one illustrated, with each of the blocks differentiated by colour, where participants will be asked to indicate the most relevant aspects that they have identified after analysing the questions in each of them. As a variant, and depending on the time we have available, you can hand out a piece of cardboard (preferably recycled) and ask each person to reproduce a figure similar to the one below:

The development of each block is explained below:

First block (10 minutes): What you love.

- Set the mood for this part with relaxation music.
- Provide each participant with at least 5 yellow post it notes and a graphite pencil or pen.
- Individually, ask participants to reflect and write down their thoughts on the following questions.
  - What activities make you lose track of time
  - What topics can you talk about for hours without getting bored
  - What are your favourite hobbies or pastimes
  - What gets you so excited that you can't stop thinking about it
  - A movie, book, or activity that makes you feel inspired
  - How do you see yourself in the future when you do what you love every day
  - How do you see yourself in the future when you do what you love every day?

In the 5 post-it notes, each participant is asked to write and draw the main ideas that emerge from the reflection of the questions analysed. These post it notes are to be pasted in the yellow box.

Second block (15 minutes): What you do well

- Set the mood with more energetic instrumental music.
- Participants will be given 5 green post it notes, a sheet of paper and a pen.

- In this second block, ask participants to identify people they trust in their environment (other participants in the group or other external people with whom they might have direct contact at that moment). Once these people have been identified, instruct them to ask the people the following questions:
  - In what activities can I excel?
  - What special skills or talents do you see in me?
  - What am I good at?

The idea is that each participant can ask these questions to their trusted people and collect the answers they give.

Once the information has been collected, ask participants to reflect on the following questions and write down their answers.

- What activities make you feel confident and satisfied
- What skills do you think you have that other people admire
- What personal achievements are you most proud of so far?

Once the questions have been asked, ask participants to synthesise the information into short sentences in the post it notes and place them in the green quadrant of the figure.

Third block: What the World Needs (20 minutes)

- Set the mood for this block with lively instrumental music (danceable rhythms).
- Hand out reuse and artistic materials to the participants such as: magazines, newspapers, coloured sheets, cardboard, plastic, coloured pencils, coloured chalk, pilots, scissors, rubber, adhesive tape, among others.
- Each participant will be given a piece of cardboard (preferably recycled, letter size) and 5 red post it notes.

- Ask participants to create a mini-collage where they express and write their reflections on the following questions:
  - What problems or challenges in your environment concern you the most?
  - What would you like to change or improve in your environment or society in general?
  - What environmental causes do you care deeply about?
  - What environmental problem in your community or the world would you like to solve if you could?
  - What is the biggest injustice that bothers you and that you would like to change?
  - What actions do you think you could take to contribute to a better world?

- Finally, ask them to summarise their reflections on the questions in short sentences and place them in the red box in the figure.

Fourth block: What you could be paid for (10 minutes)

- Set the mood for this block with instrumental music of nature sounds.
- Give participants 5 blue post-it notes and a pen.

- Based on the reflections in the third block, ask participants to brainstorm possibilities for paid actions that could solve "what the world needs", i.e. those identified problems that most drive the participant's motivations. They should write this brainstorming on post it notes and place them in the blue quadrant of the figure.

- For reflection, we offer the following questions:
  - What services could you offer that people would be willing to pay for?
  - What is the market demand for what you have to offer? What sectors do you think are in line with your values and aspirations?
  - What common problems do people or companies in your environment face that you could solve with your services or products? What are your talents most in demand by the labour market or potential customers?
  - What services or products could you offer that are unique or stand out in the market?

Debriefing (20 minutes)

Ideas from IKIGAI

- After completing the work by blocks, ask participants to go through each block and choose the aspects that are most relevant or resonate most with them. With this they will form a sentence composed of: what you love, what you are good at, what the world needs and what you could be paid for.

- Once they have made the phrase, ask them to write it on the purple post-it and stick it in the centre of the figure.

It is explained to them that the conjunction of all the blocks makes up the IKIGAI.
In plenary, the findings of each of the participants who wish to share with the group are shared and a closing session is held.

The closing should be aimed at reflecting on the importance of identifying the purpose of life and how this is linked to the professional career, to entrepreneurship and in general to all the professional activities that we can carry out.

Tips for facilitators

In order to work on this activity, the facilitator must make an important framework with the group of young people, in the sense of establishing rules of coexistence that allow for the smooth running of each of the stages.

This activity can be carried out in several working sessions with the participants in case the total time allocated to the activity is not available. Each block can be organised into separate laboratories. The important thing is to return to the work done at the end to identify possible traits that make up each person's IKIGAI.

Using different music in each of the blocks allows participants to be attuned to the type of questions they need to think about.

It is important to clarify to participants that this activity allows an approach to the search for purpose, but does not define it in a definitive way. The search for purpose is something that we rewrite as we carry out actions of self-knowledge throughout our lives.

Suggestions for follow-up

Suggest participants to place their figures in visible places, to encourage continuous reflection on the relevant aspects of identifying life purposes. Have them write down in each of the quadrants new ideas that may arise.

SMART goals: Help students set specific, measurable, achievable, relevant and time-bound (SMART) goals related to their Ikigai discoveries.

Encourage students to keep a journal in which they reflect weekly on their questions from each of the blocks and how their daily activities align with their **Ikigai.**

Ideas for action

- This activity can be linked and enhanced with the development of activities such as "vision board".
- Enables students to develop projects that relate to their interests and passions identified through the Ikigai.
- Design projects that integrate different subjects and enable students to apply their Ikigai findings in practical and relevant ways.

Useful resources

- https://www.calm.com/blog/ikigai
- https://en.wikipedia.org/wiki/Ikigai
- https://www.youtube.com/watch?v=RJ5Srezh190

16 to 30 y

18 Define, Devise and Fill with Value

1.5 hours

Tackled problem: Entrepreneurship ideas based on the identification of motivations and/or environmental or social problems.

Key concepts	• Design thinking methodology • Ideation phase • Identification of a problem • Design of the Idea / definition of product or service • Prototyping
Aim and objectives	• Participants identify environmental and/or social problems that can be transformed into business ideas. • To develop a value proposition for the business idea / venture. • To generate a model to help explain your business idea through prototyping.
Group size	10 to 25 participants

Desired Outcomes

- Teamwork
- Sustainable thinking
- Flexibility
- Acting for sustainability
- Capacity for innovation
- Creativity
- Learning by doing

Materials and hand-outs needed

The use of recycled or reused materials is favoured.
First station:
- Post-it
- Blackboard (reused cardboard)
- Pens / pencils

Second station:
- Recyclable materials: plastic bottles, wood, cardboard, string, etc.
- Craft tools: scissors, rulers, glue, etc.
- LEGO®
- Clay

Third station:
- Recycled sheets
- Pens

Activity

Preparation and briefing (15 minutes)

- Introduce the core concepts below to establish a conceptual framework that gives meaning to the activity detailed in this sheet.
- It is important to consider the characteristics of the group in order to adapt the activity as much as possible to the spatial and age conditions and to the educational levels of the participants.
- This activity requires prior preparation: it requires preparing or designing three spaces where three different challenges will be carried out.

CORE CONCEPTS:

Business Idea Design

Every entrepreneurship process should come from the detection of a challenge, taking into account our motivations, our team's motivations, social trends and perceived user needs.

It is important that at this stage of the process we do not get ahead of the search for solutions. **The ideas must be adapted to the needs of the users and not the other way round.**

Therefore, when setting the challenge, take into account:

1. *What moves me, what am I passionate about, what do I know how to do very well?*
2. *What social trends have I detected around me?*
3. *What needs do I see that are still unmet?*

But then... What is it?

Basic description of a product or service that a project or venture plans to offer to satisfy a need.

A business idea is the initial conception of a product or service that a person or group of people plan to develop and offer to the market to solve a problem or satisfy a specific consumer need.

- It must be innovative, feasible and profitable.
- It involves identifying an opportunity in the market, developing a unique value proposition and designing a business model that enables its implementation and growth.
- It arises from a process of research and analysis of the market, competition and consumer trends.

To arrive at this idea:

1) Defining a problem

- Once you have collected a significant amount of information about your client and the problem, narrow down what you have observed, and keep what helps you to clearly define the challenge you want to address.
- Define a specific problem, which will serve as a guide for the rest of the process.
- It is important to find a pattern that repeats itself, which is key to achieving the focus that the methodology requires.

2) Devising the solution

- In this phase, the generation of creative ideas to solve the identified problem is encouraged.
- It involves brainstorming sessions and other idea generation techniques, which allow for divergent, creative and original thinking, to explore a wide variety of solutions to the client's problems and needs, without worrying about feasibility at this stage.

3) Designing a Value Proposition

- It is about reflecting on whether the problem you have chosen is a problem worth solving. Is it urgent? Do enough people have it? Are people willing to pay for its solution? What value are we creating for our customers? What problem are we solving? What needs are we solving? What benefits are we creating for them?

Instructions and flow

Define, devise and fill with value:

- Ask participants to form teams of 5 people. The teams can be randomly defined or formed according to the interests of the participants. This will depend on the characteristics of the group.
- Tell them that, to complete the activity, they will have to overcome the challenges they find at each of the three stations as a team. Each challenge will allow participants to build and outline, from the identification of sustainability problems, ideas or solutions that become products and services (entrepreneurship). The challenge ends with the development of a communication strategy for the idea.
- Therefore, prior to the execution of the activity, prepare the spaces where each station will be properly signposted and prepared with the materials required to develop each challenge, in the event that we have the possibility of managing different spaces where the groups can move around.
- If space is very limited (e.g. a classroom), you can organise the groups into defined spaces and assign the challenges of the stations as they are overcome respectively.

In all cases, it is important to set a time limit for each station or challenge assigned to the groups.

Station one (15 minutes): Impact Brainstorming

Description: Conduct a brainstorming session where young people propose environmental and social problems that concern them in their locality/country. We should point out to them that it is important to look for problems that are of real interest to them, that are feasible to solve and that have a real impact today.

- The ideas should be presented in diagrams, drawings or key words using as much creativity as possible. They should analyse them and select those that the group chooses as the central problem.
- Give them coloured post-it notes, pencils and a blackboard where they will unify their ideas.

Station two (20 minutes): Green Product Challenge

Description: With the problem defined, we are going to ask the young people to think of viable solutions and to design a product or service to solve the problem identified in the previous station, using recycled materials, clay, LEGO® , etc.

The central idea is to think of a business idea that can solve the identified problem, explaining through the constructed prototype how this can impact or solve the problems.

Station three (15 minutes): A value that counts.

- Ask the participants to develop a speech telling in one minute their problem to be solved, their idea (innovative solution) and the value proposition (what different value their solution brings to the client and to the problem).
- Provide the following outline to support you:
  - Who are you and what do you do? (20 sec)
  - What do you need to solve and what solutions do you offer? (20 sec)
  - Why are you the right person/ initiative (10 sec)?

Debriefing (15 minutes)

- Once the groups have gone through the three stations, give a few minutes for the people who wish to participate in each group to tell a summary of what they have developed in the three stations.
- Ask the young participants to indicate the learnings, challenges and obstacles they encountered when developing the different challenges posed in the activity.
- Close with a closing session that will allow the central concepts to be gathered from practice.

Tips for facilitators

This activity is complemented by activity number 17 on IKIGAI purpose finding. Therefore, we recommend that, although the activities can be developed separately and without following a sequence, it is much more enriching for the learning process if the order of the activities is considered in the implementation.

- Prior to the implementation of the activity, provide the young people with a conceptual framework to accompany them in the execution of each 'challenge' posed.

- The complexity of the challenges can be adapted according to age criteria, level of schooling and physical space where the activity takes place.

Other suggestions:

- Always be flexible and open to adjustments according to the needs of the group and the circumstances of the day.
- Encourage active participation and mutual respect throughout the activity.
- At the end of the session, ask students for feedback on the activity to improve future implementations.
- Always have additional support materials on hand (markers, post-its, etc.) to cover any unexpected needs.

Suggestions for follow-up

- Use the activities and suggestions in the methodology to put into practice the search for collective solutions to the problems faced by the group of young people with whom you work on a daily basis.

- Conduct formative evaluations to understand how participants are applying the knowledge from the empathy map in their other learning spaces or everyday life. This can be through questionnaires, reflection sessions etc.

Ideas for action

- Introduce small challenges like this to address other relevant topics (academic or not) in the intervention spaces with youth groups.

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Empathy Map

16 to 30 y

1.5 hours

Tackled problem: Customer segment identification.

Key concepts	• Design thinking methodology • Empathy phase • Description of the client / identification of problems and needs • Value proposition
Aim and objectives	• Identify the main characteristics of the customer segment or users to whom the sustainable business idea (service – product) will be addressed. • Create empathy maps that capture what users say, think, feel and do.
Group size	10 to 25 participants

Desired Outcomes

- Critical analysis
- Empathy
- Teamwork
- Communication (active listening)
- Creativity

Materials and hand-outs needed

- Large sheets of paper (flipchart type) or white boards
- Coloured markers
- Post-its
- Pencils and pens
- Empathy map templates (can be pre-drawn on the large sheets) or designed in collaborative work applications
- Optional classroom props (simple costumes, thematic props) for role-playing

Activity

Preparation and briefing

- Introduce the core concepts below to establish a conceptual framework that gives meaning to the activity detailed in this sheet.
- It is important to consider the characteristics of the group in order to adapt the activity as well as possible to the spatial conditions and tasks and to the educational levels of the participants.
- This activity requires prior preparation.

CORE CONCEPTS

Empathising stage:

The empathising phase in the Design Thinking (DT) methodology is the first and one of the most crucial. It aims to deeply understand users and their needs, wants and problems. This process involves putting yourself in the user's shoes, seeing the world from their perspective and experiencing what they experience.

This stage is accompanied by different steps and actions:

- Observation: This involves observing users in their natural environment, seeing how they interact with their surroundings and with products or services. This helps to identify patterns of behaviour and problems that users may not be aware they have.
- Interviews: In-depth interviews allow detailed and personal information to be obtained about users' thoughts, feelings and behaviours. Open-ended questions are essential to encourage broad and detailed responses.
- Immersion: Designers immerse themselves in the user experience, sometimes by participating in their daily activities. This gives them a deeper understanding of the specific contexts and challenges users face.
- Story gathering: Listening to and recording users' personal stories helps to understand their experiences and emotions in richer and more meaningful ways.

The **Empathy Map** is a visual tool used in the empathising phase to synthesise the information gathered and deepen the understanding of the user. This map helps to capture the user's perceptions and experiences in various dimensions.

Components of the Empathy Map

1. **What do they say and do?** Verbatim phrases and direct quotes from users: What do they express verbally about their experiences, problems and needs?
2. **What do they think and feel?** Users' internal reflections: What matters most to them, what are their concerns and aspirations?
3. **What do they see:** Observable user behaviours and actions, what activities do they perform, how do they interact with the product or service, how do they interact with the product or service?
4. **What do they hear:** Information they receive from others, such as friends, family, colleagues and the media. What external influences affect their thoughts and decisions?
5. **Pain:** Difficulties and challenges the user faces; what problems does he/she encounter in trying to achieve his/her goals?
6. **Gain:** Outcomes and benefits that the user seeks to achieve. What do they value most in their experience with the product or service?

Benefits of the Empathy Map

- Deepening user understanding: Helps designers to better understand user emotions, thoughts and behaviours.
- Opportunity identification: Facilitates the identification of problems and needs that may not be obvious to the naked eye.
- Communication and alignment: Serves as a visual tool that clearly communicates the user's perspective to the entire team, ensuring that everyone is aligned in the same understanding.
- Empathy building: Helps designers and teams develop genuine empathy for the user, which is fundamental to designing user-centred solutions.

The empathising phase and the use of the empathy map are essential to ensure that the solutions designed really solve the users' problems and meet their needs in an effective and meaningful way.

Instructions and flow

1. Introduction (10 minutes):

- We will briefly explain what an empathy map is and its importance in business development.
- We can present a simple example of an empathy map in a visual presentation. Explain the different sections of the map: 'What it thinks and feels', 'What it sees', 'What it says and does', 'What it hears', 'Efforts' and 'Results'.
- Once the explanation is done, we can divide the group into 4–5 participants (this will depend on the total number of participants) randomly. If it is a smaller group, we can group them in pairs.

2. Definition of the Client (10 minutes):

- Identify possible customer profiles for a business idea, if the group has already worked on the business ideas and the value proposition.
- Ask each group to choose a customer profile (e.g. teenager, young adult, single mother, animal lover, etc.).
- To facilitate understanding, we can provide them with fact sheets of customer profiles of businesses or companies that are well-known to the participants, in case they have not previously worked on business ideas and value propositions. Here we suggest choosing environmentally responsible companies or companies with environmental impact that are in the participants' environment.

3. Role-Playing activity + filling in the map (20 minutes):

We will encourage empathy through role-playing.

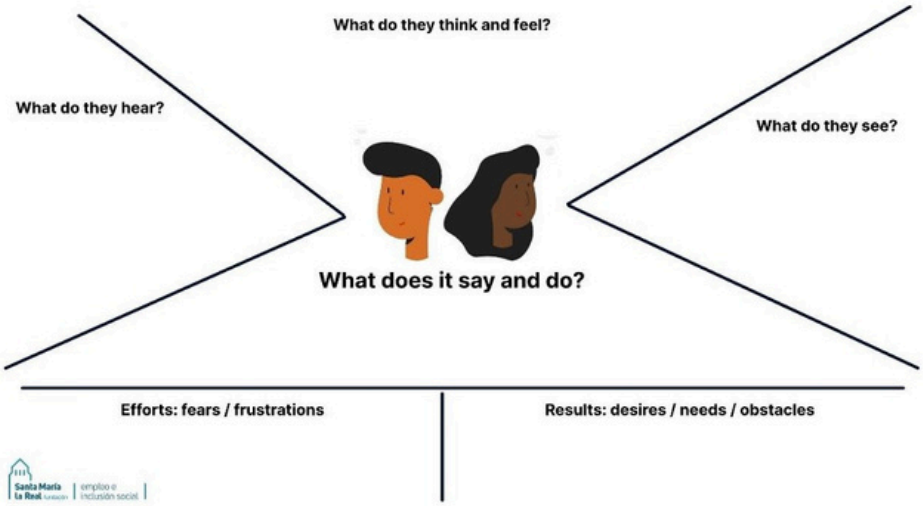
Each group should select one member to act as the client. This "client" must play the assigned role using simple costumes and props, while the other group members ask questions to fill in the sections of the empathy map.

We can use questions such as:

- What do you think about current products/services?
- What frustrates you in your daily life?
- What kinds of things do you see around you that influence your decisions?
- What do your friends/family say about these kinds of products?
- What are your main concerns and desires?

Once the questions have been asked to the client, complete the empathy map with the information obtained during the role-playing.

To do this we will provide each group with an empathy map template and post-its.



Each group should complete their empathy map based on the information collected. Participants should write on the post-its and stick them in the corresponding section of the map.

4. Presentation of results (15 minutes):

Share and compare the empathy maps between the groups. Each group presents their empathy map to the rest of the participants. They can explain the main characteristics of their client and how they came to these conclusions.

Debriefing

Reflection and closing (10 minutes):

Reflect on learning and the importance of empathy in entrepreneurship.
Guide a discussion with questions such as:

- What surprised you most about your client?
- How can this information help improve a business?
- What did they find most challenging about the activity?

Conclude by summarising the importance of the empathy map and give a brief summary of the key points. Remind participants that empathy is a fundamental competence for the development of any entrepreneurship.

Tips for facilitators

This activity is complemented by activity number 18 on Designing the idea. Therefore, we recommend that, although the activities can be developed separately and without following a sequence, it is much more enriching for the learning process if the order of the activities is considered in the implementation.

To avoid the use of paper and reduce printing, we can design the empathy map in digital applications that allow collaborative work, for example: Mural, Miro, genially etc.

If there is not enough trust between the participants in the groups, we can play some icebreaker games before the activity.

It is important to establish with the group of participants a framework of coexistence that dictates rules of desired behaviour in the relationships between all the people in the group, so that the activity runs smoothly.

In case participants have no knowledge of the "empathy map" tool, it is necessary to carry out a prior conceptual framing.

- Always be flexible and open to adjustments according to the needs of the group and the circumstances of the day.
- Encourage active participation and mutual respect throughout the activity.
- At the end of the session, ask students for feedback on the activity to improve future implementations.
- Always have additional support materials on hand (markers, post-its, etc.) to cover any unexpected needs.

Suggestions for follow-up

- Conduct formative evaluations to understand how participants are applying the knowledge from the empathy map in their other learning spaces or everyday life. This can be through questionnaires, reflection sessions etc.

Ideas for action

- Encourage participants to apply the empathy map in future classroom projects. This could include developing new ideas that solve problems faced by participants in their environments, awareness-raising and integration campaigns, or any other activity related to their participation during the teaching and learning processes.
- Introduce small weekly challenges where participants have to observe and interview real people (family, friends, etc.) to create new empathy maps.
- Show how the empathy map can be integrated into other subjects or daily life activities.

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Modelling an Idea

16 to 30 y

1.5 hours

Tackled problem: Business models from the agile methodology.

Key concepts	• Modelling the business idea • Business Model Canvas
Aim and objectives	• The young people will have the practical experience of developing each of the components of the Canvas model, which will allow them to transfer theoretical concepts to the creation of a real business model. • That young people acquire the knowledge that will enable them to understand the usefulness of the Business Model Canvas in everyday life, from school projects to personal ventures.
Group size	10 to 25 participants

Desired Outcomes

- Leadership and teamwork skills
- Environmental awareness
- Creativity and innovation
- Critical analysis
- Assertive communication

Materials and hand-outs needed

- **Templates of the Business Model Canvas:** These can be printed on large paper or drawn on a large board for group activities.
- **Post-its of various colours:** For students to write their ideas and stick them on the template.
- **Markers and pens:** To write on the post-its and on the template.
- **Whiteboards or flipcharts:** For additional note-taking and outlining.

Activity

Preparation and briefing

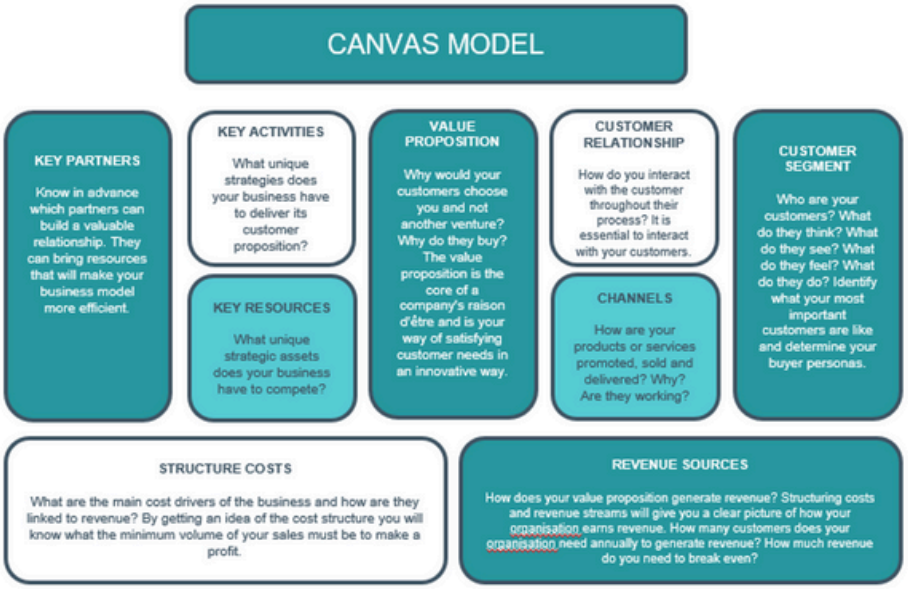
- Introduce the core concepts below to establish a conceptual framework that gives meaning to the activity detailed in this sheet.
- It is important to consider the characteristics of the group in order to adapt the activity as much as possible to the spatial and age conditions and to the educational levels of the participants.
- eThis activity requires previous preparation, i.e. it is necessary to work previously with the group of young people on the key concepts of the model, to explain the 9 components and to provide clear examples of modelling through the Canvas model of companies close to or known to the participants.
- If you have already done activity two and three of this module you can use the designed business ideas, the description of the customers and the value proposition. Otherwise, we will provide you with two business ideas that could be developed from the Business Model Canvas.

KEY CONCEPTS:

The sustainability canvas is a tool used to develop sustainable business strategies. It is based on the concept of the Business Model Canvas but focuses specifically on integrating sustainability considerations into all areas of a business.

- It is a methodology that develops in a simple and precise way the different aspects of the business idea that are necessary for the correct functioning of an enterprise.
- It is a model that provides a lot of clarity on: **what you do, how you do it and who you are addressing.**
- It is a tool that allows you **to have a clear global vision of the entrepreneurship** you want to promote.
- It is presented in a visual way, on a canvas that allows you to raise ideas, review them, renew them, move them or change them to find new ways or solutions to the challenges of undertaking a GREEN business.
- It uses a systemic methodology, which means that all its components are interconnected.

It is a



Instructions and flow

1. Group Formation and Idea Selection (15 minutes)

- First give a brief overview of the modelling stage of the business idea and the Business Model Canvas.
- Divide the students into groups of 4–5 people.
- Each group should discuss and select a business idea to work on. Here are 3 examples of ideas you can use. You can also provide other concrete examples that are close to the reality of the participants.

2. Canvas development (30 minutes)

- Give the young participants a canvas like the one attached, preferably drawn or printed on large paper.
- Ask them to fill in each of the components using the post it notes to place their ideas, following the indications below:

1. **Customer segments:** Each group identifies their customer segments and writes them on post-its. They then paste them in the corresponding section of the BMC.
2. **Value Proposition:** Students define what problem their product/service solves and what benefits it offers. They write these propositions on post-its and place them in the BMC.
3. **Channels:** They discuss how they will reach their customers and which channels they will use to sell their product. They write their ideas on post-its and stick them on the BMC.
4. **Customer Relationships:** They define how they will interact and maintain relationships with their customers. They post these ideas on the BMC.
5. **Revenue Sources:** They identify how they will generate revenue and what their main sources of revenue will be.
6. **Key Resources:** Determine the resources needed to develop their value proposition.
7. **Key Activities:** Define the essential activities they need to perform to make their business model work.
8. **Key Partners:** Identify their necessary partners and allies.
9. **Cost Structure:** Finally, they calculate the costs associated with their business model and write them in the BMC.

3. Feedback (25 minutes)

- Each group presents their BMC to the rest of the class. They should explain each of the blocks and

Debriefing (20 minutes)

- Discuss with the students what they learned from the activity and how this knowledge can be applied in the future.
- Thank the young people for their participation and effort, and summarise the key points of the activity.
- Finally, reflect on how these tools can be useful in other academic or everyday life activities.

Tips for facilitators

- **Advance preparation:** Familiarise yourself well with the Business Model Canvas and its components. Prepare simple examples that young people can easily understand the content and instructions of this activity.
- **Create a creative environment:** Make sure the workspace is comfortable and conducive to creativity. Consider playing soft music in the background and having a relaxed atmosphere.
- **Encourage active participation:** Encourage all young people to participate and express their ideas.
- **Guide without directing:** Act as a facilitator, not a director. Let young people develop their own ideas, providing guidance when necessary. It is not necessary that the canvas is perfectly filled in, it is better to focus on the experience, the debate of ideas and the collective construction.
- **Provide constructive feedback:** Make sure to encourage positive and constructive feedback among all young participants. Emphasise strengths and offer suggestions for improvement in a respectful way.

This activity can be developed with collaborative apps, in case you have digital devices, such as: Mural, Miro, Genially, where you can design the Canvas canvas and thus avoid printing and using paper.

Suggestions for follow-up

- You can conduct a short evaluation or survey to gather feedback on the activity and possible improvements.
- You can develop a form that collects information on the main learnings that remain with the young participants after the implementation of the activity.

Annex 1

Sample evaluation form

1. Basic Information:
- Name (optional)
- Age
- Gender (optional)
- City/Country

2. Experience of the Activity (Likert scale or multiple choice):
- How satisfied were you with the activity? (1–5 scale)
- Was the duration of the workshop sufficient? (Yes/No/Too short/Too long)
- How would you rate the instructor's demonstration? (1–5 scale)
- Did you enjoy working in groups? (Yes/No)
- How would you rate the materials provided for the workshop? (1–5 scale)

3. Learning Outcomes:
- What new skills or knowledge did you gain? (Open-ended)
- Did you learn practical upcycling techniques that you can apply in your daily life? (Yes/No)
- Did this activity change your awareness or attitude toward environmental sustainability? (Yes/No)
- Which GreenComp competences do you feel you improved? (Select multiple)
  - 3.3 Exploratory Thinking
  - 4.2 Collective Action
  - 4.3 Individual Initiative

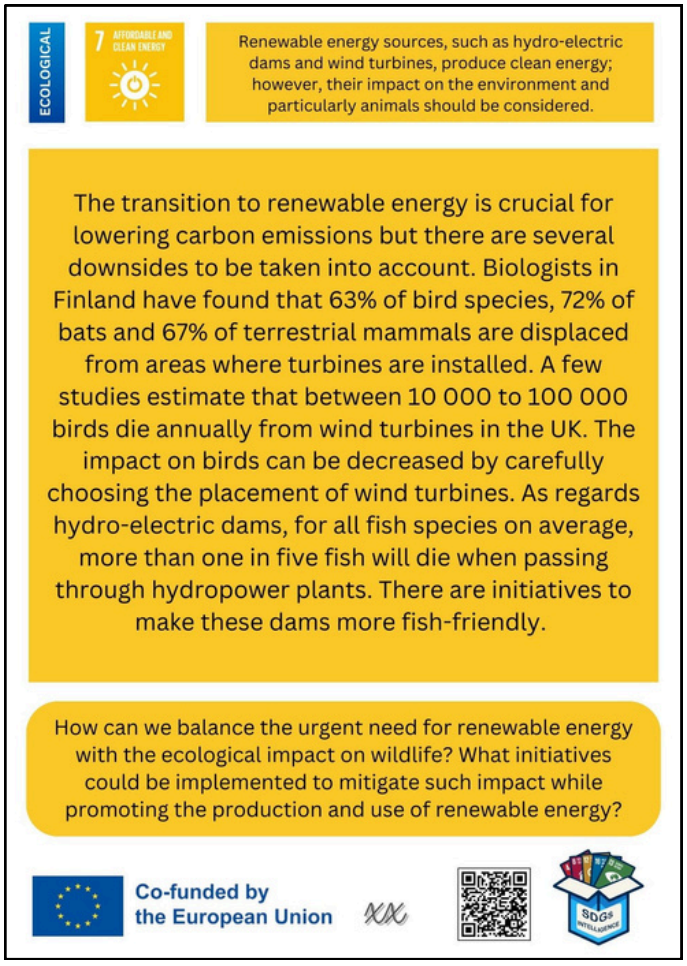
4. Group Reflection (Open-ended):
- What was the most valuable part of the workshop for you?
- What challenges did you face during the upcycling process?
- How do you plan to use or share what you've learned?

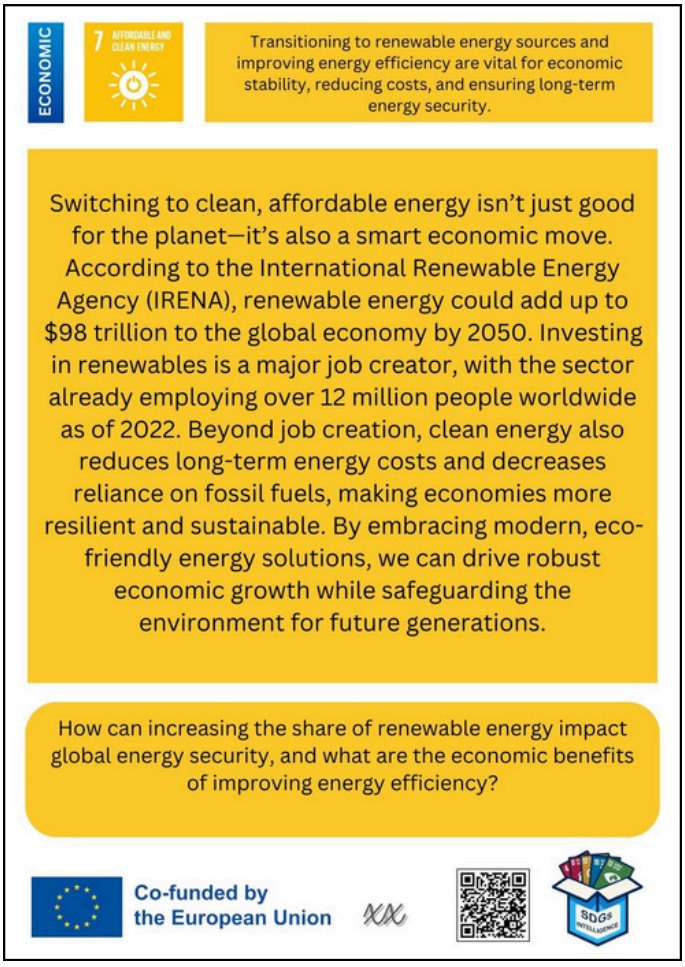
5. Suggestions and Follow-up (Open-ended):
- What improvements would you suggest for future workshops?
- Are you interested in participating in follow-up activities (e.g. upcycling clubs, community events)?

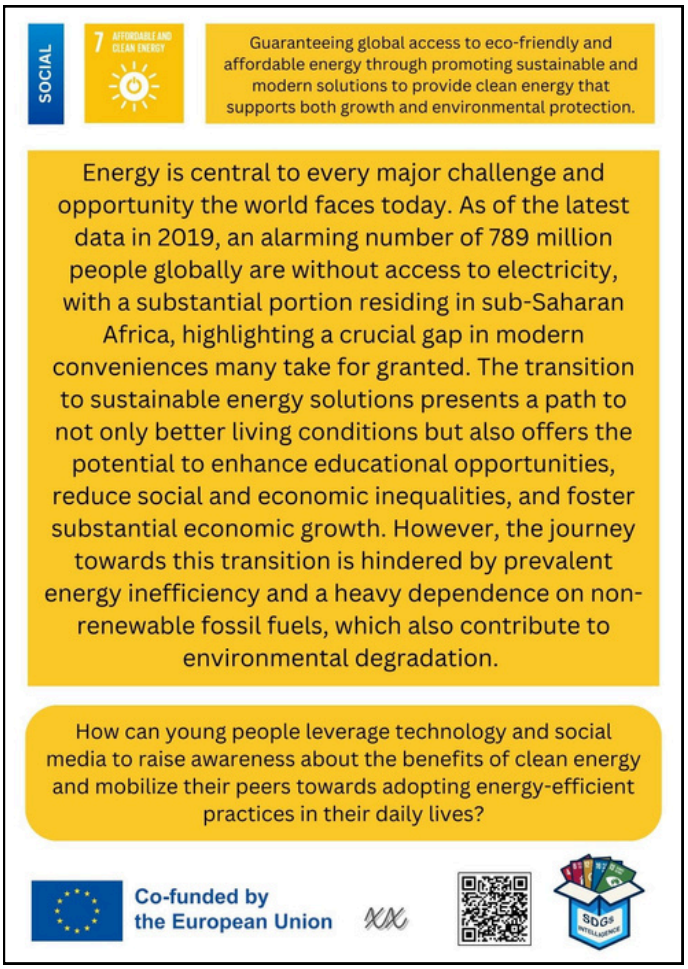
6. Optional Media Uploads (File upload feature):
- Upload photos of your upcycled creations.
- Upload a short reflection video (if applicable).

Annex 2

Cards on SDG 7.







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