Inclusion, Environment, Science Education

GUIDING PRINCIPLES

Learnings and reflections to foster social inclusion of vulnerable adults in science communication on climate and environment developed in the Come Together project

COME TOGETHER

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1. Introduction

This scaffolding document shares key insights from the Come Together project, which brought together educators, scientists, community actors and adult learners in order to co-create inclusive educational activities on environmental and climate issues. It reflects the collaborative process of designing science education formats about climate and environment, specifically tailored to adults from various vulnerable communities across five European cities, namely Berlin, Ljubljana, Milan, Paris and Vienna.

Considering the diversity of the project partners and the wide variety of target audiences, stakeholders and educators involved, the outcomes and practices developed in the national hubs differ across contexts. Some aspects were central to one hub, but less relevant in others. Despite this variety, however, a set of guiding practices emerged from the shared practices across all hubs – principles that proved important to help all partners move towards a socially more inclusive science education on environmental and climate issues.

These principles form the basis of this scaffolding document and are to be understood as guidelines to reflect on own practices and to plan socially more inclusive activities – with and for underserved adult target groups, such as, for example, Roma communities, homeless people, women with no formal school degree, etc. With this document, we seek to show how social inclusion, adult learning, and climate/environmental education intersect in practice.
Therefore, the guiding principles highlight successful means towards more inclusive activities and provide insights into how to make science education more relevant, participatory and empowering for adults facing complex social and environmental realities.

Rather than offering a step-by-step instruction, this document serves as a scaffold – a supporting structure to guide reflection, inspire adaptation and foster the development of inclusive science education activities. The scaffolding document is not meant to be prescriptive but should be understood as a practical resource to help shape local approaches in ways that are responsive to the needs and realities of specific adult audiences.

What distinguishes this document is that its content is grounded in practice and discussions among the project partners and the participants of their respective hubs.
The guiding principles are derived from partner's practical experiences, expertise or existing literature. Experiences in the hubs are based on observations of communities, discussions with local actors and learning through practice. The guidelines combine the shared experiences of the Come Together partners, the members of the national hubs and the adults who participated in the co-created formats.

HOW TO USE THIS DOCUMENT

This document is aimed at people and institutions working in science education, communication or outreach, whose objective is the development of inclusive activities through co-creation processes with adult learners. The scaffolding document is intended for facilitators, educators, museum professionals, NGO workers, scientists and anyone involved in inclusive learning processes centered around environmental/climate issues.

The document is not structured as a linear toolkit but rather as a collection of guiding practices that can be explored and adapted to different contexts and needs. You can use it to:

1. reflect on your current educational approaches,
2. plan or adjust inclusive learning activities for adults,
3. co-create formats and spaces with your audience, and
4. support training processes for educators and communicators.

Each core principle (see chapter 3) is rooted in informed practices and reflects real challenges, tensions and moments of insight from the hubs. Some principles highlight what was helpful; others reflect what had to change. Hence, the diversity of various target audiences and contexts is reflected in this document, making it adaptable to different needs.

2. Learning with and from local hubs of experts

DEFINING AND FORMING LOCAL HUBS

In order to bring different approaches, ways of thinking and methods for science education together, each partner country established local hubs.
The hubs center around reflections of their own approaches towards inclusive science engagement activities on climate and environmental issues.

Yet, what exactly is a hub?

When thinking of hubs, we generally refer to a central point that connects or coordinates multiple elements, often serving as a focal point for activity, communication or distribution. However, the specific understanding of hubs depends on the context. In the context of Come Together as well as in many participatory and experimental public participation approaches, hubs are defined to bring multiple people, stakeholders or communities together to work on a common goal. People within such hubs bring different perspectives to the table, which might sometimes be reinforcing or juxtaposing each other but could also challenge or contradict each other. Hubs are therefore inevitably dynamic, constantly developing and evolving.
Yet, hub members work together on a shared topic and enrich the outcomes through the inherent diversity in perspectives mentioned above.

In the process of developing a hub, we invited to and carried out various hub meetings in which the community could exchange ideas, opinions and share their knowledge. In these hub meetings, the organizing project partners gave information on the Come together project, guided the discussion and provided the space to enable hub members to express their thought processes. In order to allow for a dynamic process of collaboration, different formats were incorporated. For instance, group discussions, individual reflections, discussion games, but also creative elements like imagination exercises or hands-on Tinkering elements were used to kickstart the co-creation process of science education formats.

THE OBJECTIVES OF THE LOCAL HUBS

As to the Come Together project partners, we invited various groups of people to join our local hubs and to participate in the process of co-creation.
Members of these local hubs were, for example:

- science facilitators and educators
- social workers with access to target audience
- members of the respective target audiences (underserved adult communities)
- scientist
- indigenous experts
- local experts on climate communications
- activists
- artists

• local government employees
• other stakeholders with interest in climate issues and inclusion of local communities.

In general, the hub meetings aimed to define principles and characteristics of inclusive science communication on climate and environmental issues. Over the course of these meetings, individual needs and different local requirements were identified.
Upon reflection of the Come Together project partners, the specific outcomes of the hub meetings informed the design of a) training modules targeted at facilitators and educators, b) general guiding principles for activity development and facilitation (see chapter 3), as well as c) the co-creation processes done at a later stage in the project.

DIVERGING PERSPECTIVES AND INDIVIDUALISED PROCESSES

Despite this attempt to establish a common context, however, the individual processes within each hub largely differed from each other. Given that each local hub and their respective members had diverging interests, values, ideas and methodological approaches, it would have been difficult to generalise and unify these different discourses. Furthermore, the discussions and methods in the hubs were rooted in real-world contexts and driven by different needs, affordances and necessities their members. In order to acknowledge this multi-dimensionality, individualising the processes and accepting the differences between all hubs was an essential step in the project.

An important guideline for the project partners was the approach to value all participants, to reflect on own expectations and to be prepared to let go of them in the process.
In short, "the people who are here now are the right people! They want to work with us, and we want to work with them!" Even if it might seem obvious, this assumption was crucial for managing expectations within the hubs and to navigate emerging discussions.
Based on these discussions, the project partners then derived key principles and characteristics of inclusive science communication.

LOCAL HUBS AND THEIR ROLE IN CO-CREATION PROCESSES

Following the hub meetings, selected members of each hub participated in a co-creation process dedicated to the development of inclusive science engagement activities on climate and environmental issues.

At this point it is essential to establish a common understanding of co-creation, since this is yet another term with multiple meanings, depending on the context. In general, co-creation refers to a collaborative process in which different (groups of) people work together in order to develop a product, service, idea or solution to a specific issue. Their different perspectives, experiences, and areas of expertise are a vital part of the process. Further pivotal parts are shared ownership, equal participation and mutual learning, making co-creation processes an important tool in inclusive science communication.

Referring back to the five local hubs in this project, we used co-creation processes to enhance discussion and reflection on inclusive science education for vulnerable adults focussing on environmental and climate issues. While the hub meetings were highly dynamic and open in their progress, the co-creation process was adapted to the local context and the respective target

groups of underserved adults in each partner country. Nonetheless, the reflections and discussions from the hub meetings informed the co-creation processes as well.

IMPLICATIONS FOR INCLUSIVE PRACTICES

As we have learned through working with local hubs, acknowledging different realities and accepting that there might be difficulties in including all intended audiences in the hubs is an important part of the process. Focussing on the participants and their individual perspectives and needs rather than trying to adjust them to a ready-made and thoroughly planned process is a key element in inclusive (science) communication.

In the following chapter, key principles of how to realise a community-centred, inclusive and action-driven approach will be discussed in more detail. While these principles have not been explicitly formulated in the hub meetings, they were derived from individual needsand discussions in these meetings and therein form a useful basis for facilitators and educators working with underserved adult communities.
Yet, this list of guiding principles is not to be understood as a complete framework or even checklist, but rather as source of inspiration reflecting the shared knowledge of our local Come Together hubs. As the name scaffolding document implies, the guiding principles should serve as a scaffold for the readers aiming to enhance social inclusion in their science education programs or their work with diverse communities in environmental education formats.

3. Core principles of inclusive climate communication

The following section summarizes essential principles of inclusive climate communication, as developed and reflected upon in the learning processes within the local hubs. Each principle is introduced and contextualized shortly and undermined with examples as well as practical implications and reflection questions for individual activity adaptation. Further, many principles can be linked to concrete training modules and reflect the methods co-designed and used in the Come Together project (see chapter 2).

Moreover, these guidelines are the result of the co-creation processes undertaken in the local hubs and were elaborated on the basis of shared knowledge and experiences from all project partners. The selection of guidelines and practical implications has directly evolved from the hubs and has further been informed by preceding projects and partners' expertise on inclusion. In other words, the following principles share community-orientation and have been derived from practical work with the communities rather than from a merely theoretical point of view.

PUT THE COMMUNITY IN THE CENTER

If we re-consider the overarching objective to define practical guidelines for inclusive science communication formats on climate and environmental issues, one assumption is central to all these principles; the target communities, i.e. groups of underserved adults, are to be the center of the activities rather than the project's objectives, organizers' expectations or pre-defined learning outcomes. Hence, derived from the individual learning processes in the local hubs, we argue that as project organizers we need to be prepared to always put the community in the center and to accept that the control of the process lies with them and not with us as organizers.

Based on this objective, we acknowledge the heterogeneity of target audiences in the local hubs as an important factor in the compilation of the following guidelines (see chapter 2). Furthermore, we acknowledge the challenge to find common principles when working with substantially different audiences with diverse individual needs. Some principles might have been essential to some communities, while other principles were inapplicable in these contexts. Hence, the selection of principles is to be seen as a set of practical insights open for adaptation rather than a rigid framework. We believe that this increases the practicability of this document, as it can be used in different context of both informal and formal educational programs.

3.1 Start with the community

DESCRIPTION

"Start with the community" means to fully and directly involve the people who will be affected by the activities you plan to implement. Include members of the community in making decisions and carrying out activities from the start, which makes the activity seem more legitimate and builds a sense of trust and ownership.
This principle can be summarized as 'nothing about us without us.

WHY IT IS IMPORTANT (IN CONTEXT OF SCIENCE EDUCATION WITH ADULTS FROM DISADVANTAGED COMMUNITIES)

Marginalized adults are often absent from climate change discussions and they rarely see themselves having a role in them. This undermines the vital importance of understanding the target audience – their needs, interests and potential, as well as the barriers they face when engaging in new activities. By collaborating with these target audiences from the start of the project, we can understand their circumstances better, build a level trust and, most critically, design relevant initiatives that will have their support. This approach significantly increases the likelihood that members of the community will participate, ensuring that the collaboration's outcomes are both meaningful and sustainable.

Start collaboration by partnering with organizations that are led by/closely work with the target community. These organizations are essential as they can not only provide crucial insights on the specific needs of the group but also serve as mediators between your organization and the community. Their direct contribution to both the design and the implementation of relevant activities is therefore indispensable.

EXAMPLES FROM OUR EXPERIENCES

Setting the topic of an activity based on communities' needs (Ljubljana):
Before starting the project, we contacted Roma representatives from three different communities in order to understand their interests, needs and preferences.
As participants in the hub and co-creation meetings, they significantly shaped the topic that was relevant to all three communities – food.
They contributed to both the design and the implementation of the activities: they operated as mediators between their communities and the museum; they helped to organize the activities and were responsible for inviting the members of their communities to participate; some of them also carried out selected activities which they are experts for. This contributed to a large number of participants and guaranteed the relevance of the content for target communities.

Collaborating with members of the community as mediators (Berlin):
Since the start of the project, SPK has closely collaborated with a Ukrainian museum educator who was actively involved from the beginning in developing and conducting the activities as well as in inviting Ukrainian groups. Thanks to her experience with Ukrainian groups in Ukraine and Germany, she served as a vital link to the community and could integrate her insights on which topics are relevant to them. The events were designed flexibly, allowing content to be adjusted during sessions in order to reflect participants' interests.
The activities also fostered exchange between recently arrived Ukrainian women and Southeast European refugee women having already lived in Berlin for a longer time. Together with "Südost Europa e.V.", who manage the intercultural garden, we initially organized a casual meet-up

to get to know each other. Sharing interests as well as personal experiences and expertise contributed to the choice of topics and their links to climate and environmental education. Thanks to the close involvement of the museum educator, the activities stayed relevant and mostly well-attended. We succeeded in building close and trusting relationships with both groups which remain strongly tied to the representatives as crucial links to SPK.

PRACTICAL TIPS FOR ACTIVITY DESIGN

- First, gather general information on the target community you want to work with.
- Ideally, contact local NGOs and community representatives even before applying for the project, or at least as soon as your project is confirmed.
- Before designing activities for the target community, work together with its representatives to clearly define the relevant content and the specific target group you want to involve (e.g., youth, parents, elderly, women, etc.).
- Instead of relying on preconceptions and making your own assumptions, ask representatives questions about the community and their needs.
- Don't approach the activity design with ready-made solutions. It's essential that community representatives contribute to both the design and the implementation of the activities.
- Give people the opportunity to express what they need and what they want to learn.

REFLECTION QUESTIONS FOR ACTIVITY DESIGN

- Can your activities help find solutions to the community's challenges or needs?
- Is your activity based on what the community wants to learn, rather than what you want to teach?

FURTHER READING

Simon, Nina (2010): The Participatory Museum. Accessible: www.participatorymuseum.org

Golding, Viv; Modest, Wayne (eds) (2013): Museums and Communities: Curators, Collections and Collaboration. London etc.: Bloomsbury.

Onciul, Bryony: Michelle L. Stefano; Hawke, Stephanie (eds) (2017): Engaging Heritage, Engaging Communities. Woodbridge: The Boydell Press.

3.2 Engage with the person before the topic

DESCRIPTION

Before you introduce content, build a human connection by showing genuine interest in the participants. Make it clear to yourself and the audience that the activity is about them, not about the teaching of specific content. This can spark interest in the interaction and allows for discussions and learning at eye level.

WHY IT IS IMPORTANT (IN CONTEXT OF SCIENCE EDUCATION WITH ADULTS FROM DISADVANTAGED COMMUNITIES)

Without some form of personal connection, it is difficult to create meaningful interaction. This matters especially in informal learning settings, where participants often meet the facilitators for the first time and may only join for very few activities. Long-term relationships would be ideal, but are often not feasible due to institutional or temporal constraints, for instance.
Still, even a single encounter or interaction can help to build some trust and to leave a strong impression on the participants. Therefore, taking time at the beginning of an activity to build a relationship helps to overcome an initial distance.

Humans are social beings; often, it seems to have more impact who says something rather than what is being said. A respectful and positive relationship to the facilitation team and within the group can therefore make participants more open to climate and environmental issues, even when the topic itself might not seem interesting at first.

In addition, people usually want to be seen and treated with respect. If they feel acknowledged and taken seriously, they are more likely to participate actively and to feel comfortable to contribute their own perspectives.

Lastly, as facilitators, we need to be genuinely willing to connect with people; not only to improve the quality of the activity for participants, but also to make the encounter more enjoyable and meaningful for ourselves.

EXAMPLES FROM OUR EXPERIENCES

Show genuine interest in peoples' experiences (Vienna):
During an activity test in a park in Vienna on a hot summer day, a facilitator met two young men from Afghanistan – one open to a talk, the other one not.
By starting with questions about their lives, interests and everyday experiences, the facilitator built a personal connection that led to a more open exchange. Eventually, it became possible to not only talk about their passion for cars or life in Afghanistan, but also about climate change, summer heat and reforestation of Afghanistan as a possible solution to environmental issues.
The facilitator noted that this reflection only became possible once a human connection was established, instead of introducing the topic directly.

Using poetry to connect with participants (Milan):
In Italy, we ran activities with homeless people in collaboration with a local NGO. The NGO educators used poems about the beauty of nature to connect participants' personal experience with climate change. Starting from a poem read by the facilitator and the analysis of the text, participants discussed their experience of nature when they were children in their home countries, their emotions, the family memories, the tree they were used to see, how they experienced life

in the family and in nature, etc. Thanks to the consolidated relation with the participants, the educator has been able to use the poem as a way to connect with participants' life, knowledge and emotions before connecting to the topic.

PRACTICAL TIPS FOR ACTIVITY DESIGN

- Use small icebreaker activities to get to know each other and to build some rapport.
- Include informal breaks in workshop plans to enable small talk and the informal exchange.
- Plan enough time at the beginning to establish a good connection.
- Show genuine curiosity and ask about participants' daily life, experiences, or interests before steering toward climate or environmental content.
- Try to signal openness and interest in your nonverbal communication. Establishing eye contact, a friendly tone and placing yourself in the middle of the group rather than standing at the front could be helpful.

REFLECTION QUESTIONS FOR ACTIVITY DESIGN

- When meeting a group for the first time, how do I make it clear that they matter more than the content I brought?
- Do I show respect and recognition for participants as people – beyond their role in the activity?
- Am I attentive to nonverbal cues (tone, body language, expressions) that affect how participants perceive me?
- In what ways do I personally benefit from these connections – does it make my work more enjoyable and meaningful?

3.3 Ensure local relevance

DESCRIPTION

The relevance of educational activities hinges on local implementation. This approach enables targeted responses to everyday issues, better outreach to specific audiences in their own environments and meaningful integration of their experiences. By grounding global challenges in local contexts, educational initiatives become more accessible, relatable and effective.

WHY IT IS IMPORTANT (IN CONTEXT OF SCIENCE EDUCATION WITH ADULTS FROM DISADVANTAGED COMMUNITIES)

When addressing climate and environmental issues, it is essential to connect these issues to peoples' everyday lives to make abstract concepts tangible. Use places and experiences familiar to target groups in order to link global challenges to peoples' lived realities to make them more relevant to them. Invite participants to bring in their own local perspectives to further strengthen personal and cultural identification with the topic.

Education and communication on climate and environmental issues often fails to resonate with adults from underserved communities, not due to a lack of interest, but because the topics and formats rarely connect to their everyday experiences. Locally grounded approaches are essential to make topics relevant; they allow educational activities to reflect the realities, concerns and knowledge of the people they aim to reach. Traditional institutions such as museums have historically been shaped by class-based hierarchies and often reinforce classist power dynamics. By creating spaces rooted in local contexts and emerging from lived experience of underserved adult communities, barriers can be lowered and power dynamics might be shifted.
In particular, the perspectives from those outside dominant power structures offer valuable insights that expand and challenge conventional knowledge. They are crucial for creating a more context-sensitive and grounded understanding of environmental challenges and for building a way of science education that is inclusive, engaging and meaningful.

Place-based and community-rooted knowledge such as indigenous ecological knowledge highlights the deep connections between culture, identity, memory and local environments.
At the same time, working on a local and tangible scale helps participants to link abstract global issues to their immediate environment and to recognize possible steps to action.
This does not only foster a sense of agency and motivation, but also supports a more hopeful perspective, which is psychologically essential for coping with the complexity, contradictions and emotional weight of the climate crisis. Therefore, local relevance becomes key to inclusive education and emotional resilience alike.

EXAMPLES FROM OUR EXPERIENCES

Using public green spaces as local environments (Berlin):
For the educational activities of the Ethnologisches Museum in Berlin, the intercultural garden Rosenduft and the Park am Gleisdreieck proved to be important local resources.
In informal conversations with our Bosnian and Ukrainian target groups, personal experiences of displacement were shared alongside cultural meanings of in the garden.
The act of cultivating familiar plants, for example, can create a sense of belonging and continuity for displaced individuals, transforming gardens into spaces where personal history intersects with environmental learning. In this example, the garden served as a safe space

for exchange and helped to initiate discussions about environmental and climate issues. Additionally, participants explored local insects and the significance of wildflower meadows during a park visit. Environmental ethnographic approaches and indigenous knowledge practices were employed by presenting a community garden project from Macucu, Colombia, highlighting global perspectives on participatory gardening and the dangers of monocultures.
This way, the activities linked local experiences with global challenges, fostering social inclusion and environmental education relevance.

Roma settlements as local spaces for activities (Ljubljana):
The Slovene Ethnographic Museum decided to carry out all project activities in local settings where Roma communities live. This approach was chosen in order to better align with the target groups' current needs and interests. In one of these communities, the Roma had established an NGO focusing on collecting and using herbs based on their heritage. We used the herb garden as space for all the activities and included indigenous knowledge of this Roma community by inviting them to present their work to us. This way, the activity centered around the local community, valued their lived experiences and existing knowledge and made their contributions to environmental issues visible.

PRACTICAL TIPS FOR ACTIVITY DESIGN

- Get to know your target group and the environment which is familiar to them or to which they can easily relate to.
- Collaborate with local partners and communities.
- Use familiar, accessible places as learning spaces.
- Start with personal stories and everyday connections.
- Address local and global connection.
- Incorporate practical, hands-on activities which involve body movement or thinking/exploring topics with their hands.
- Build informal settings which enable light conversations whilst doing something together to get to know each other, for example, by preparing food together.

REFLECTION QUESTIONS FOR ACTIVITY DESIGN

- Does your activity give room to participants to discover their own local connection?
- How are local communities involved in the process? How are they given agency?
- How could you establish a connection to the everyday lives of your participants?

FURTHER READING

Stavola, Fabrizio; Calcagnini, Sara (2025): Inclusion, Environment, Science Education – Activity Toolkit. Chapter 2.12 A Garden Journey. Come Together.

Haraway, Donna J. (1988): Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. Feminist Studies 14 (3), S. 575–599.
Available online at https://philpapers.org/archive/HARSKT.pdf

Kimmerer, Robin Wall (2013): Braiding Sweetgrass. Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants. Minneapolis: Milkweed Editions.

3.4 Challenge ourselves

DESCRIPTION

As facilitators, educators and institutions, we must challenge our own assumptions, biases and agendas. This means being willing not only to teach, but also to learn and to reflect on what motives or goals we can set aside in order to open space for genuine co-creation with disadvantaged communities. Stepping out of our comfort zone helps us to engage more honestly and inclusively with our target audiences.

WHY IT IS IMPORTANT (IN CONTEXT OF SCIENCE EDUCATION WITH ADULTS FROM DISADVANTAGED COMMUNITIES)

This principle does not focus on the audience but on us, the science educators and facilitators. It asks educators and institutions to critically reflect on their own assumptions, agendas and comfort zones, in order to truly open space for co-creation and avoid reproducing the barriers we seek to overcome. If we want to genuinely put the community in the center, we must also be willing to put ourselves aside, which requires questioning our practices, motives and institutional goals. This shift creates room for participants' perspectives, knowledge and values in order to shape the activity, rather than the activity being framed only by our agendas.

Taking a learner's perspective helps us to gain new insights, to become more creative and develop ideas that enrich our own practice. It can be beneficial to try new and unusual methods and to assess how they perform or if they fail. Furthermore, it is important to maintain flexibility and openness to change. Apart from that, being open to working in unfamiliar contexts challenges us to leave behind the safety of established routines, and this very discomfort can lead to more inclusive and meaningful approaches.

EXAMPLES FROM OUR EXPERIENCES

Learn from and reflect on exploration (Milan):
The team from MUST began exploring new ways to engage with vulnerable communities and visited a day center for homeless people in order to understand how science activities might fit into this context. What they encountered was surprising and contrary to their assumptions. The center already offered a wide range of culturally rich activities, like poetry activities. This fostered meaningful social interactions and helped to overcome even major language barriers. Equally striking was the willingness of homeless participants to express their views on broad societal issues, moving the discussion far beyond immediate basic needs.

This encounter triggered a reflection within the MUST team. Their usual approach often placed scientific content at the center. This experience challenged their ingrained hierarchies of knowledge, showing that what counts as expertise in a museum is not always the most relevant in the social context of the day center. It also led the team to reconsider the aim of their activities. Rather than transmitting content, they could provide platforms for dialogue, exchange, and shared reflection – where science and technology are woven together with social justice, emotions, and lived experience.

Being challenged by feedback (Vienna):
During the co-creation process, the SCN team developed a prototype of an activity on climate data visualization. Trainers who regularly worked with young, unemployed and low-educated women from a career guidance program had emphasized that their participants often disliked engaging with numbers and data. The SCN team was eager to discuss and test diverse possible activities with 6 invited women from the program to see their preferences.

The participants clearly expressed that they did not want to do the data activity.
This feedback directly challenged the team's assumptions and their intention to teach data skills. The workshop program was therefore further developed according to the wishes of the target group. The very high engagement of other participants during the rollout of the activities provided evidence that letting go of their own agenda successfully improved the content and relevance for the audience.

PRACTICAL TIPS FOR ACTIVITY DESIGN

- Spend a lot of time watching, listening and discussing.
- When working with an unfamiliar community, start by learning from them and others who have already worked with them, before thinking about what you want to provide.
- Don't look at the topic in technical or scientific terms, but use it to enhance the knowledge and skills of the people you want to involve.
- Be open to trying new methods, even if they challenge your routines, and assess what works or needs adapting.

REFLECTION QUESTIONS FOR ACTIVITY DESIGN

- In which contexts does the audience freely express their knowledge and values? How are these different from my usual institutional settings?
- What are the assumptions, goals or motives I bring to this project? Which of them could I set aside to open more space for co-creation?
- How much do I truly see myself as a learner alongside the audience, not just as a teacher?
- Am I willing to enter unfamiliar contexts and to adapt my practice, even when it feels uncomfortable or uncertain?

FURTHER READING

Simon, Nina (2010): The Participatory Museum. Online: https://participatorymuseum.org/read

Saito, Kohei Saito (2020): Capital in the Anthropocene Cambridge: Cambridge University Press.

3.5 Listen actively

DESCRIPTION

Listen actively to your audience and create enough space in educational activities for everyone to share personal thoughts, experiences, and knowledge. Welcome different perspectives without judgment to build trust and enable mutual reflection – even if they challenge your assumptions.

WHY IT IS IMPORTANT (IN CONTEXT OF SCIENCE EDUCATION WITH ADULTS FROM DISADVANTAGED COMMUNITIES)

In climate and environmental education, discussions often trigger feelings of guilt, defensiveness or moral judgment of peoples' lifestyles, even though individuals and disadvantaged communities are certainly not the cause of the environmental crisis. This can reinforce power imbalances or a sense of exclusion. It can also result in avoidance or disengagement with the topic.
Active listening helps counter these dynamics, but only if shared content is valued as well.
If people feel respected for their opinion, hierarchies can be reduced. This further creates trust, which is an important baseline for discussions at eye level and enables reflection of one's own point of view on what should be practiced by participants and facilitators. Listening to each other can further reveal unexpected connections between participants and the topic as well as reasons why it matters to them.

Practically, active listening is also a good learning tool for facilitators and trainers. It uncovers what truly concerns the audience, allowing to adapt content and emphasize related aspects. Therefore, listening to the audience should already begin during the activity development.

EXAMPLES FROM OUR EXPERIENCES

Learning through listening and peer-exchange (Vienna):
In a co-creation meeting, six people from the target group, young women from a career guidance program, were invited to test several prototype activities. In the reflection sessions afterward, the participants highlighted how much they valued activities where they could share their own opinions. What surprised us was that they also rated these activities very highly in terms of learning outcomes. They explained that much of their learning came from listening to each other, exchanging perspectives, and discussing their views. This peer-to-peer exchange helped them understand certain issues better and discover new perspectives. Based on this experience, the final activities for the target group were designed with elements where sharing experiences or knowledge and listening to each other is included.

Listening first in prison workshops (Paris):
In France, a session with prisoners was devoted entirely to listening to their knowledge, feelings and desires in relation to climate change. After explaining the context and how important it was for us to hear what they had to say, we began by creating a collective mind map where everyone could say what climate change meant to them.
The participants then shared their vision of the future in relation to climate issues. We formed small groups to facilitate discussion and listening. We also asked them about their emotions related to these issues, their experiences, what worried them, and what they would like to know more about. This allowed us to invite a researcher to a second session to answer the questions that interested them most.

PRACTICAL TIPS FOR ACTIVITY DESIGN

- Include specific time in your activities, where participants share their thoughts and the others (including the facilitators) are active listeners.
- Make clear, that opinions, personal stories and perspectives are welcome to be shared and should be valued by everybody. They can be discussed respectfully, but should not be judged as wrong or bad.
- Don't only think of what you want to teach as facilitator. Be curious and think of what you want to learn from your audience.
- Allow yourself some flexibility in consecutive activities in order to be able to react to what you have heard from the audience adequately.
- Reflect after activities how much you have been listening.

REFLECTION QUESTIONS FOR ACTIVITY DESIGN

- Are you really interested in your audience? What would you like to know from them?
- Do all participants get a fair chance to speak in your activity and are their perspectives genuinely valued by you and the group?
- Is the extent of teaching and learning in a good balance?
- How would you react to highly problematic thoughts from the audience?

FURTHER READING

Stavola, Fabrizio; Calcagnini, Sara (2025): Inclusion, Environment, Science Education – Activity Toolkit. Chapter 2.10 Climate Collages. Come Together.

Le Floch, Fannie; Oualian, Catherine (2025): Inclusion, Environment, Science Education – Training Guide. Chapter IV.1 Expressing views on climate-related scenarios: Discussion game. Come Together.

Le Floch, Fannie; Oualian, Catherine (2025): Inclusion, Environment, Science Education – Training Guide. Chapter IV Training modules Dialogue Methods. Come Together.

3.6 Create emotional safety

DESCRIPTION

Environmental and climate issues often entail emotional responses from participants – positive and negative. Creating a supportive environment and accepting all emotions that arise during an activity is important to make participants feel respected and heard, which encourages open dialog and deeper engagement with the topic. Finding a way to re-frame negative emotions helps to drive positive actions.

WHY IT IS IMPORTANT (IN CONTEXT OF SCIENCE EDUCATION WITH ADULTS FROM DISADVANTAGED COMMUNITIES)

Since human actions and moral decisions are not only based on rationale, but mostly on emotions, they are an important driver of the discussion on climate and environmental issues. When working on issues loaded with different – positive and negative – emotions, it is important to cater for all emotions and to establish a supportive atmosphere where those can be shared without shame (if the participants want that). In particular, negative emotions such as fear, aggression or hopelessness can feel destructive, as they have an inhibiting effect on participants. Accepting these emotions and providing a space to share them is a first step to re-frame these emotions into productive actions. A safe environment makes it possible to discuss difficult topics, to acknowledge strong emotions and to build trust between educators and participants.

Apart from negative emotions caused by the topic of climate change, we have to consider that some individuals carry individual emotional burdens and that trauma could be triggered as part of workshops centered around communities' needs and lived experiences. Again, establishing a good rapport at the beginning and showing that all emotions are okay to be expressed in the workshop helps to create emotional safety. Furthermore, providing adults with the choice to leave anytime or to take a break, might help to establish a safe environment. However, it should be made explicit that facilitators can usually not provide therapeutic help and are not professionals in dealing with trauma. Having a list of helplines ready to share with participants can be helpful for them to seek professional help if they feel in need of that.

EXAMPLES FROM OUR EXPERIENCES

Imagination exercise to evoke climate emotions (Vienna):
In a workshop with young women with limited access to education, SCN facilitated an imagination exercise to evoke images associated with climate change. Which feelings arise when thinking about the topics? What do they see? The participants were then asked to visualize their imaginations and to build a collage with these climate images.

Emotions are a special focus in this exercise and they are catered for in two ways: before starting the imagination exercise, there was a disclaimer that negative emotions or intense reactions could occur. Participants could skip this activity or stop participating at any point, if they felt uncomfortable with it.

The focus of the imagination is on emotions, and all arising emotions should be visualized and noted down. In the final collages, particularly negative emotions are discussion, aiming to find ways to find concrete, productive actions that can be driven by this emotion in a positive way.

Connecting to everyday realities of communities (Berlin):
When working with underserved adults, it is helpful to familiarize yourself with the challenges they face in everyday life. In Germany, we therefore organized an informal meeting at the "Intercultural Community Garden Rosenduft" before we started conducting the actual activities with Ukrainian and Bosnian refugee women. Despite not having an agenda, the meeting was an opportunity to get to know each other, the garden, its program and its trauma support for refugee women from South-eastern Europe.

Apart from conducting climate and environmental education activities, it was important for us to create an atmosphere in which the women felt safe enough to share their experiences of displacement, as well as their hopes and wishes for their near future in Berlin.
They also shared feelings of grief and pain about having to leave their homeland and loved ones behind, as well as their desire to return home. As a link to climate and sustainability issues, stories about cultivating local plant species from one's homeland in Berlin demonstrated how a connection to home can be established in a foreign place. For that reason, topics around plants and green spaces also became one of the main focuses during our activities.
The shared experience of the participants and the safety to share any emotions formed an important link to the topic and made sure that participants could take positive actions based on negative emotions.

PRACTICAL TIPS FOR ACTIVITY DESIGN

- Set clear group agreements that encourage respect, confidentiality, and listening.
- Provide options for participation (e.g., speaking, writing, drawing) so participants can choose what feels safe.
- Be attentive to signs of discomfort and offer breaks or alternative ways to engage.
- Use facilitation methods that balance openness with boundaries, avoiding discussions that may overwhelm participants.

REFLECTION QUESTIONS FOR ACTIVITY DESIGN

- How do I signal to participants that their feelings and experiences will be respected?
- What measures do I take to prevent re-traumatization or emotional overload during my activities?
- Do participants have real choices in how and when they contribute?
- How can I build trust step by step, rather than expecting it immediately?

FURTHER READING

Le Floch, Fannie; Oualian, Catherine (2025): Inclusion, Environment, Science Education – Training Guide. Chapter IV.4 Taking emotions into account: Stinky fish. Come Together.

Le Floch, Fannie; Oualian, Catherine (2025): Inclusion, Environment, Science Education – Training Guide. Chapter IV.5 Lecture about emotions. Come Together.

Le Floch, Fannie; Oualian, Catherine (2025): Inclusion, Environment, Science Education – Training Guide. Chapter VI.1 Deep listening: tell your climate story. Come Together.

Stavola, Fabrizio; Calcagnini, Sara (2025): Inclusion, Environment, Science Education – Activity Toolkit. Chapter 2.10 Climate Collages. Come Together.

A tool to test: A carbon handprint measures positive actions to reduce climate change impacts, going beyond personal carbon footprints. If such actions are multiplied, they can outweigh one's footprint. https://go-positive.co.uk/what-is-a-carbon-handprint

3.7 Recognize inequalities

DESCRIPTION

Take power imbalances into account when designing and conducting activities and be mindful of intersectional inequalities. Ensure participation is possible for everyone, while also openly acknowledging disparities – both between facilitators and participants and within the audience itself – to avoid reproducing them involuntarily in the activity

WHY IT IS IMPORTANT (IN CONTEXT OF SCIENCE EDUCATION WITH ADULTS FROM DISADVANTAGED COMMUNITIES)

Climate change affects all social groups, but it impacts the socially vulnerable more. These groups generally have fewer economic, political and informational resources to cope with the impacts of the climate crisis. Their housing is typically less resilient to extreme weather events like heatwaves, floods and fires, and their access to healthcare often is limited. Additionally, their weaker economic standing makes it harder for them to take part in adaptation activities that require financial investment. This is precisely why it is crucial to involve marginalized communities in efforts to adapt to the climate crisis and to strengthen their voice in policy – and decision-making processes.

However, many climate education activities have been designed for dominant groups and focus on reducing greenhouse gases. This discourse can generate feelings of anger among audiences who contribute the least to global warming. Denying the inequalities faced by marginalized groups can also create additional symbolic violence.

In order for action to be effective, it must acknowledge inequality through the concept of intersectionality on multiple levels. Many factors such as race, class, education, gender and economic resources result in combined forms of discrimination and privilege. In practice, this requires recognizing these dynamics not only in society at large but also in the activity room – between facilitators and participants and within the audience – and making them visible in a respectful way. Doing so builds trust, shows awareness of participants' realities, and offers a systemic rather than an individual-centered vision. Crucially, acknowledging inequalities must go hand in hand while still recognizing participants' agency. Otherwise activities risk reproducing the very imbalances they seek to address.

EXAMPLES FROM OUR EXPERIENCES

Enable participation by providing childcare (Ljubljana):
When designing activities for Roma communities, we also took into account the intersectionality of marginalization, which was also pointed out by Roma representatives co-designing the activities. Therefore, alongside the main activities, we organized parallel programs for children to enable Roma women, who often carry the primary responsibility for childcare, to participate as well.

Providing tools for affordable eco-cosmetics (Paris):
A hub member from the French team reported on an activity focused on producing eco-friendly household cleaning products. The target audience, residents of a low-income neighborhood, could not afford expensive cosmetics or the one-time investment in equipment needed to make them themselves. The activity was therefore designed to both provide the necessary equipment and to share the knowledge of how to use it. This combination allowed participants to continue

producing their own sustainable products after the workshop, making the practice affordable and empowering in the long term.

Acknowledging inequalities in restricted contexts (Paris):
During a science education initiative with prisoners, some participants wanted to take action to promote recycling and local food. However, this was not feasible within the prison system due to existing decision-making structures and restrictions.
As a facilitator, openly acknowledging these limitations and the unfairness of the situation helped to maintain a connection with the audience and show understanding of their realities – even when no immediate solution was possible.

PRACTICAL TIPS FOR ACTIVITY DESIGN

- Conduct activities in familiar environments where members of the target community feel empowered because they are at ease and relaxed.
- Focus the activity less on what participants don't know and more on the abilities and knowledge they already bring, so they feel empowered as a community.
- Regulate speaking time and offer diverse modes of participation so that power imbalances within the group are addressed rather than reproduced.
- Pay close attention to what participants understand and adapt your language and content accordingly. Reduce language barriers and avoid assuming high prior knowledge.
- When presenting adaptation or mitigation strategies, ensure they are realistically achievable by your audience. Avoid glorifying consumption restraint in ways that stigmatize economic disadvantage.

REFLECTION QUESTIONS FOR ACTIVITY DESIGN

- Is your planned activity equally accessible for every member of your target community (with regards to intersectionality)?
- Am I unintentionally reinforcing hierarchies through my facilitation choices – or opening space for more equal exchange?
- Do I acknowledge the audience's lived realities (economic, social, cultural) while also recognizing their agency and contributions?
- Have I created opportunities for participants to influence the flow of the activity, or is it still shaped mainly by institutional goals?

FURTHER READING

Le Floch, Fannie; Oualian, Catherine (2025): Inclusion, Environment, Science Education – Training Guide. Chapter V.2 Lecture about Inclusion. Come Together.

Le Floch, Fannie; Oualian, Catherine (2025): Inclusion, Environment, Science Education – Training Guide. Chapter V.3 Approaches for inclusion: Case study. Come Together.

4. Action-oriented principles

Apart from community-centeredness, inclusive science communication on climate and environmental topics can be reached through an action-driven approach. The strategies which were mentioned most often and seemed most important across all hubs are presented in the following section and should – again – be seen as an additional source of inspiration for inclusive practices rather than a rigid framework.

4.1 Action drives beliefs

DESCRIPTION

Encouraging people to act is a powerful way to build engagement. Taking actions – even in small ways – helps to overcome feelings of helplessness and strengthens the belief that change is possible. One action often triggers another, leading to deeper commitment and a stronger sense of agency.

WHY IT IS IMPORTANT (IN CONTEXT OF SCIENCE EDUCATION WITH ADULTS FROM DISADVANTAGED COMMUNITIES)

Taking action helps people to move beyond feelings of helplessness in the face of climate and environmental challenges. Research shows that acting is not only a way to cope with difficult themes but also a powerful driver of change in beliefs. Promoting action is particularly relevant for empowerment. As one action leads to another, engagement deepens and people develop a stronger sense of agency — knowing how to act. Small, practical steps taken together help participants realize that change is possible, both individually and collectively.

Disadvantaged groups are often seen as passive or unable to act, but this is misleading. Action demonstrates capability, respects their lived experiences, restores confidence and creates entry points for long-term engagement. For communities facing climate change and environmental challenges, starting with concrete steps during activities can transform attitudes. Action also reduces the distance between abstract global problems and everyday life.

EXAMPLES FROM OUR EXPERIENCES

Hands-on sustainability practices (Paris):
The workshop can invite participants to take action directly during the activity – by doing their own laundry with eco-friendly methods or planting a seasonal vegetable themselves (project shared by Planète Sciences as part of the French hubs). In other activities, they prepared and shared a local vegetarian meal. Starting to act during the activity reduced the gap between learning and doing, making sustainable practices concrete and easier to adopt afterwards.

Defining their own questions (Paris):
People living in precarious housing chose to discuss pollution in unhealthy homes with a scientist. The chosen topic – "How to cope with pollution when living in unhealthy housing?" – increased motivation, since it came from their own concerns (project shared by ATD Quart Monde, Universités Populaires, as part of the French hubs).

Family and community as levers (Paris):
Involving children often motivates parents to participate, driven by the wish to build a better future for them. The other way around, seniors bring valuable life experience and can be powerful voices in conversations about climate change.
In one workshop, seniors expressed the desire to repeat the activity with their grandchildren – for example, by building a weather station together.

PRACTICAL TIPS FOR ACTIVITY DESIGN

- **Start to act during the activity**
  Practical demonstrations – such as cooking without meat or planting together – show that change is possible.
  → Reflection: Which practical demonstrations can be relevant to be reuse by the participants in their context?
- **Avoid activities that your audience has already done many times and where there is nothing new to discover**
  This can give the impression that you are not offering activities that have real value.
  For example, in the context of one of the hub members, making Tawashi sponges was too mundane/routine an activity to really make people want to participate or take action.
- **Offer choice**
  Autonomy builds motivation. Let people choose the actions they want to try, especially when their daily lives allow little freedom.
  → Reflection: Do participants feel they can freely decide?
- **Relay children or community as levers**
  Family and community ties often motivate action.
  Activities for or with children can mobilize adults effectively.
- **Imagine desirable futures**
  Invite participants to co-create visions of positive futures and then imagine together the actions that need to be done. Avoid focusing only on present conflicts. For example, we did creative writing workshops on how people will live in 30 years' time.
- **Change the local environment**
  Suggest activities that form new behaviors natural and adapt to the communities' specific context.
  For example, prepare eco-friendly washing powder together and highlight money saved.
- **Provide long-term support**
  Offer continued guidance and resources for participants and their caregivers to sustain action and to maintain a sense of connection and community.

FURTHER READING

Le Floch, Fannie; Oualian, Catherine (2025): Inclusion, Environment, Science Education – Training Guide. Chapter IV.6 Encouraging action: Climate Handprint. Come Together.

A tool to test: A platform to identify actions according to their effort level and benefits: www.nhm.ac.uk/take-part/find-your-climate-action.html?utm_source=short-url-gallery-20250327-ag&utm_medium=short-url&utm_campaign=fobp-gallery

De Meyer, Kris et al. (2021) "Transforming the stories we tell about climate change: from 'issue' to 'action'" Environmental Research Letters 16. DOI: 10.1088/1748-9326/abcd5a.

Keith, Lindsay; Griffiths, Wyn (2021): "SCENE: A novel model for engaging underserved and under-represented audiences in informal science learning activities." Research for All 5. DOI: 10.14324/RFA.05.2.09.

Watson, Claire (2019): How do we engage communities in climate action. Online: www.marei.ie/wp-content/uploads/2020/07/How-do-we-Engage-Communities-in-Climate-Action-e-version.pdf

4.2 Avoid misplaced responsibility

DESCRIPTION

When working with vulnerable adults on issues of climate change it is important to be aware of real live circumstances of the audience and structural inequalities. Don't place the burden of change on those with limited resources or power and make that explicit to the group.

WHY IT IS IMPORTANT (IN CONTEXT OF SCIENCE EDUCATION WITH ADULTS FROM DISADVANTAGED COMMUNITIES)

Vulnerable groups are most affected by negative consequences of climate change and often lack resources or power to mitigate these effects, whereas those causing a lot of harmful effects do not yet feel severe consequences. Placing responsibility for change onto vulnerable adults therefore is neither fair nor does it lead to the input and actions necessary.
It is essential to acknowledge the realities and experiences of vulnerable adults with limited access to financial, sociopolitical or personal resources and not to place responsibility for changing systemic problems on these individuals.
Instead, activities should allow for participation in a way that is meaningful, showing vulnerable adults aspects where they can have an impact (on a small scale), for example by participating in discussions and by sharing their own experiences and opinions. Furthermore, learning activities should emphasize the systemic dimension of climate change, shifting the focus towards collective actions rather than individual responsibility. This approach should help to mitigate feelings of guilt of powerlessness and to show possibilities to address systemic inequalities, thereby enabling participation in a way relevant and meaningful to audiences.

EXAMPLES FROM OUR EXPERIENCES

Focus on systemic actions (Vienna):
In Austria, we conducted workshops using their discussion game „Klima-Blickwinkel" (in English: "perspectives on climate change"). This discussion game contains various future scenarios imagining Vienna in 2040, with certain sociopolitical measures in place to drastically reduce CO_2 emissions. Participants rank different statements on a continuum ranging from probable to improbable, based on their own opinion.

In the discussion, the focus is on societal dimensions of climate change and it is made clear that the responsibility to resolving climate issues is not placed on vulnerable individuals. Yet, their perspective is a valuable contribution to the discussion.
This is made explicit in a second step of the game, were the endpoints of the continuum are changed to desirable and undesirable, focusing on participants' personal wishes and requests they have to those in power. Responsibility for action is thereby clearly placed onto people in power and vulnerable adults are not blamed or lectured for their individual lifestyle choices, but their individual perspective and impact on the discussion is acknowledged.

Highlight collective action as driving force for societal change (Ljubljana):
In Slovenia, an activity to provide practical solutions to reduce food waste was developed. Within the local hubs we carefully reflected on how we could design activities for marginalized groups that ensure that responsibility is not placed on those with limited resources.
In co-creation meetings and training sessions, we thought about what meaningful benefits these activities could bring to the everyday lives of Roma communities. As part of the educational activity, participants discussed various ways to reduce food waste in the household in order

to raise awareness that individuals already have valuable practical knowledge. By sharing this knowledge with one another, individual actions were taken together into collective actions, while the individual perspectives were heard and respected. Cultural heritage and common knowledge were acknowledged as way to show individuals that they can have a small impact, yet the need for collective action is highlighted. The responsibility to reduce food waste in society, however, is placed on those in power and not on the participants.

PRACTICAL TIPS FOR ACTIVITY DESIGN

- Focus on systemic solutions
- Don't blame the wrong individuals – make sure to place responsibility for climate action on those causing climate change rather than on those with limited power or resources.
- Include audiences' realities and lived experiences in the activities and acknowledge structural inequalities.
- Provide opportunities to share personal opinions and experiences.

REFLECTION QUESTIONS FOR ACTIVITY DESIGN

- To what extent does the activity reflect structural inequalities?
- Who is given responsibility for climate action in the activity? How does that reflect individual resources and (limited) power of the target audience?

FURTHER READING

Stavola, Fabrizio; Calcagnini, Sara (2025): Inclusion, Environment, Science Education – Activity Toolkit. Chapter 2.11 CO2 Experiments and Discussion Game. Come Together.

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COME TOGETHER

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