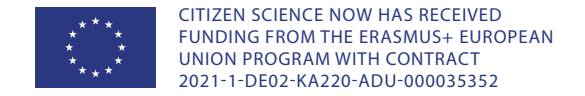


CO-CREATION



WHY

Co-creation and co-design increase the quality of participation



HOW



RECOMMENDATIONS

The role of the facilitator

- Support communities
- Address the interests of all communities
- Ensure good communication
- Strive to create empathy, trust and respect
- Maintain a permanent balance between all actors

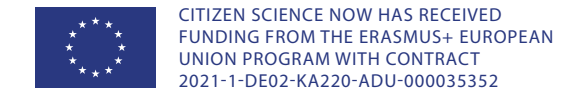
Good practices

- Use plain language for clear communication
- Experiment to facilitate reflection and learning
- Show and act, don't just describe
- Work within cooperative and horizontal settings
- Listen to and engage with participating communities

Actions

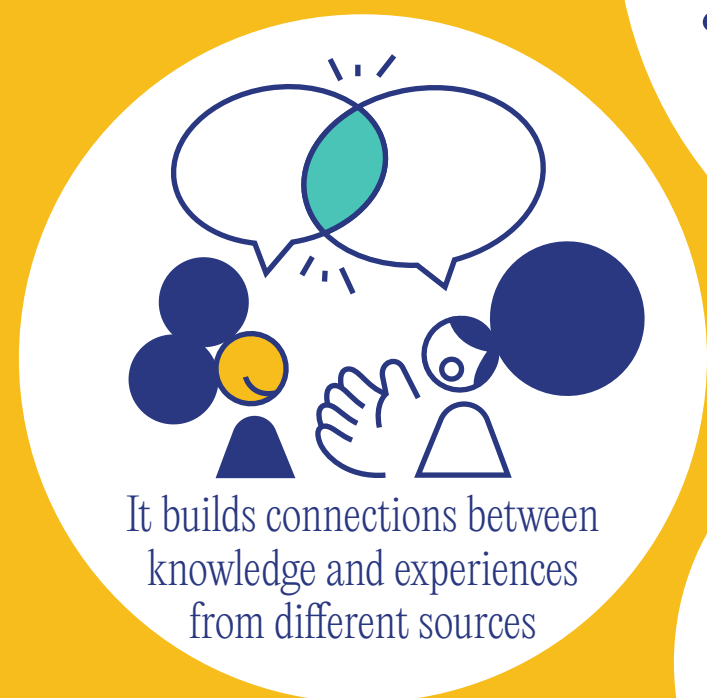
- Generate visual elements and physical, tactile materials
- Use design thinking strategies
- Provide clear information about goals, tasks and commitments
- Generate documents to ensure traceability and transparency
- Evaluate at each stage and change strategy if necessary

COMMUNITIES

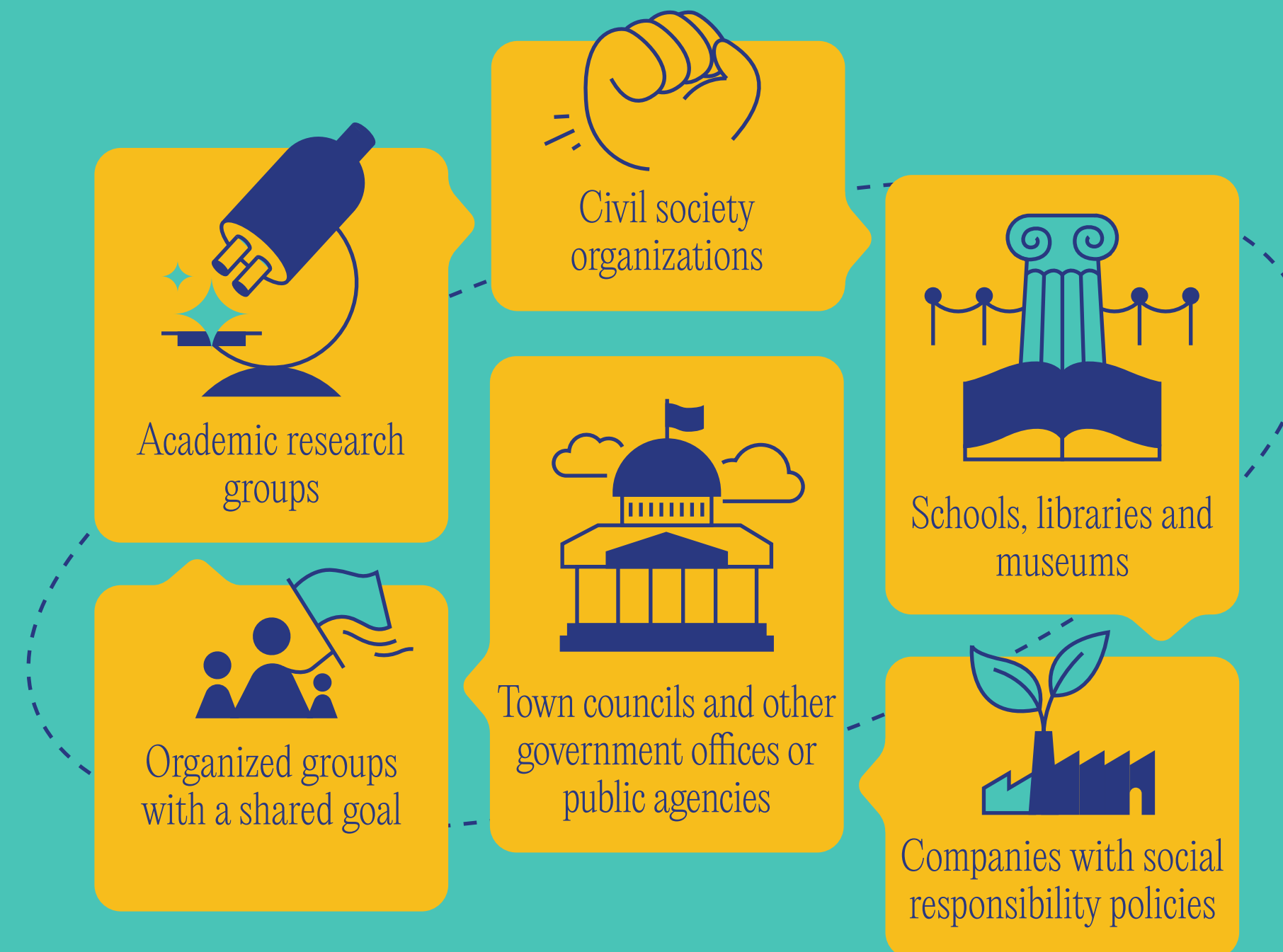


WHY

Increasing participation improves the quality of a citizen science project



HOW



Create a promoter group with one or several communities

RECOMMENDATIONS

Arrange participation on different levels according to commitment and availability

- Promoter group
- Diverse communities and groups with expertise in the project area
- People able to provide first-hand knowledge through direct experience
- Citizen scientists

Responsibilities of the promoter group in ethically responsible research

- Support communities
- Establish permanent communication with communities and individuals
- Structure participation according to commitment and availability
- Share knowledge
- Acknowledge and share all contributions

Attitudes, strategies and recommendations

- Encourage diversity in the participating communities
- Provide ample spaces and opportunities for participation
- Lead the project collaboratively
- Create a respectful atmosphere and dialogue between equals in a safe space
- Create opportunities for mutual learning
- Establish expectations and forecast benefits for all participants and monitor progress

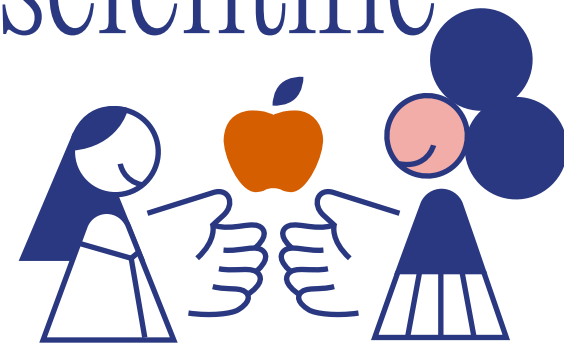
TOOLS & METHODS

WHY

Citizen participation redefines the tools and methods used in scientific research



It provides form and structure for collective intelligence



It provides a forum for sharing knowledge



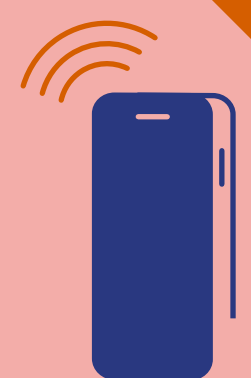
It gathers data on a massive scale



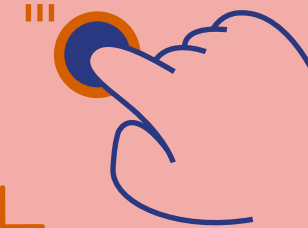
It organizes data and knowledge according to standardized protocols

HOW

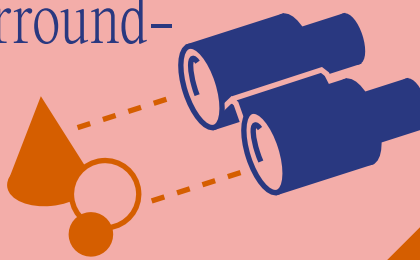
Use mobile devices and low-cost sensors



Categorize elements under supervision



Document observations of the surroundings



Provide personal perspectives



Communities take part in the data collection process

RECOMMENDATIONS

Balance between a gratifying experience for participants and scientific rigour

- Facilitate self-learning and self-reflection
- Develop gamification strategies
- Maintain the rigour of scientific research
- Consider quantitative and qualitative research methods and tools
- Use standardized methods to engage communities

Co-design and prototyping sessions

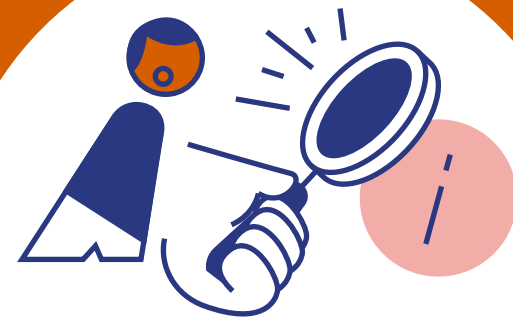
- Envisage scenarios in the execution stage
- Address the needs of the participating communities
- Guarantee technological inclusion and offer alternatives if necessary

Accessible, tested and verified tools and methods

- Prepare materials and guides for the autonomous use of tools and methods
- Share methodologies and protocols among the scientific community
- Standardize tools, methods and protocols for different communities and contexts
- Contrast or calibrate using validated sources, methods, data and information

WHY

Citizen science generates data and evidence that would be hard or impossible to obtain otherwise



It generates information and knowledge that is difficult to obtain without participation



It creates new data reflecting the concerns of a community or collective



It provides actionable knowledge


HOW



Ensure data storage is secure and adequately organized according to current legislation



Supervise data quality alongside participants or experts



Document data with tutorials and metadata



Follow established standards



Preserve privacy



Acknowledge participants as co-authors

Data management

RECOMMENDATIONS

Open data following the FAIR (findable, accessible, interoperable, reusable) principles

- Easy to find
- Accessible and well-documented
- Connectible to other data and information sources
- Reusable for other initiatives or by other actors

Other data to improve a citizen science project

- Dynamics of citizen participation
- Communication and monitoring of the project
- Academic and social impact of the research
- Changes in perception, attitude and knowledge among participants

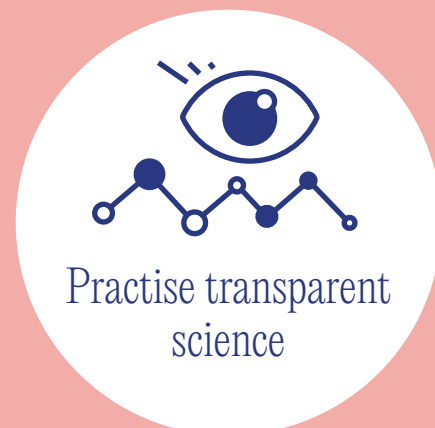
Activities to make data more accessible

- Make data more comprehensible with clear and concise messages
- Publish data in open repositories
- Publish documentation and results in peer-reviewed scientific journals
- Organize communication and dissemination activities: talks, events, newsletters, hackathons...
- Create tools for data visualization and easy navigation

ETHICS & INCLUSION

WHY

Ethics of inclusion in research increase confidence and credibility



HOW



RECOMMENDATIONS

Ethically responsible relationships in integral research

- Establish transparent and equitable relationships
- Listen to all perspectives
- Create spaces for joint decision-making
- Distribute responsibilities equitably
- Acknowledge individual contributions while preserving anonymity

National or international regulations (GDPR) to ensure the privacy and security of data related to participants:

- Restrict the use of data to the purpose for which they have been gathered
- Anonymize data to prevent risk of identification
- Limit the data storage period
- Maintain confidentiality in all communication

Informed consent as a tool to formalize participation

- Share the research goals and specific actions
- Present information in formats that are understandable for all participants
- Stress that participation is voluntary
- Ensure that express authorization is given
- Provide for the legal capacity of participants

ACTION

WHY

Citizen science offers formats facilitating transformative science



Individual

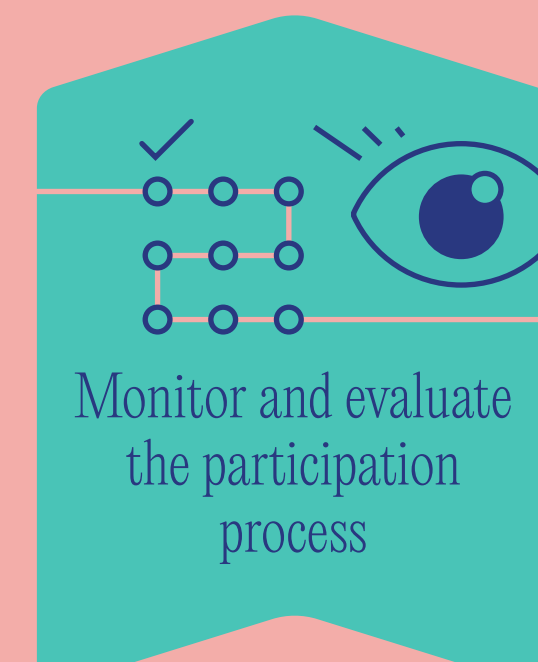


Social



Institutional

HOW



How to transform knowledge into actions

RECOMMENDATIONS

Institutional action

- Set an action-based scientific research agenda, for example in the framework of sustainability
- Strengthen institutional democratization
- Contribute to a decision-making model based on scientific evidence
- Monitor public policy and citizen rights
- Get new data sources
- Foster interaction between different actors with shared agendas

Social action

- Promote collective awareness
- Increase public sensitivity
- Ground public debate in solid argumentation
- Provide a bridge between science and society
- Promote inclusion and social cohesion
- Encourage participation and activism

Support for individual action

- Display sensitivity to our surroundings
- Engage actively in addressing problems
- Imagine achievable futures
- Link and connect realities
- Integrate knowledge
- Co-produce and act
- Acknowledge diversity and foster inclusion