

# Thinking through citizen science – activities, policies, and frameworks

**Task Zero:** Find a free space in the table, and write your definition and example

	<b>My definition (50 words or less)</b>	<b>Top example of citizen science</b>
1	Citizen science is when anyone follows the scientific method (doesn't have to be peer reviewed journal writing). Can even be traditional "scientists" contributing to knowledge in another field.	Bloggers doing experiments and sharing their results online. Github contributors. <a href="https://publiclab.org/">https://publiclab.org/</a> , <a href="https://www.evilmadscientist.com/">https://www.evilmadscientist.com/</a>
2	Research projects by scientists that involve data collection or/and analysis by non-scientific "citizens" that contribute both time and local/experience etc. and perform their duties according to rigorous guidelines.	Geolocation, Google Maps scouting, translations (latin, ancient greek), language saving (native american)
3	Research that is (also) done by non-professional scientists including various exercises along the research process - from start to finish. This could include tasks such as the formulation of research questions, data collection, analysis, interpretation but also the co-creation of entire research projects.	Zooniverse, iNaturalist, CitSci, ...  also many local co-created projects initiated by citizen scientists
4	When non-scientists 'do some science'. This can include collecting data or interpreting it, in experiments pre-conceived by scientists (typically).	Seasearch, Project AWARE, projects on Zooniverse, the Big Seaweed search, Bioblitz
5	Amateur-experts and trained-experts work together on a scientific topic to answer a specific research question.	Charles Darwin most famous data collector, Christmas bird count
6	Participation and collaboration of people and the public in the research process, they could contribute to data collection, monitoring, ...	Crowd-sourcing and data collection
7	Volunteer participation in data collection for science & research	Volunteers carrying out species surveys for fun and submitting data to schemes/institutions E.g. iNaturalist, eBird
8	Research that fully engages with the experiences and knowledge of people from a wide variety of backgrounds, whether scientist or layperson, etc.	Improvement of health care outcomes by engaging with communities to shape studies to understand what approaches can help within complex, interconnected systems

9	Bringing people closer to scientific research and empowering them to use critical thinking and researching abilities	Lay people collecting data in their own community, as in detecting air or water pollution
10	Citizen science is when local people work with the researchers to solve an issue/challenge faced by people and scientists.	Volunteer data collection - eg. bird species presence records
11	Making citizens, population part of the research process. Not only as a passive participants, but as active actors, so the results of such activities reflect real current situation and is useful for the community	Patient, carers, families and other stakeholders involvement when designing care protocols
12	Empowerment and involvement of lay people in research to create an enriching dialogue and generate publicly funded projects that are relevant for society.	Patient and public involvement in clinical research to define patient-relevant projects
13	Citizen science describes scientific research that involves direct participation of non scientifically educated people to collect data.	
14	Citizen science is giving back science to citizens, by including them in the process.	Sample and evidence collection; participatory mechanisms and co-creation in local governance.
15	Citizen science is the inclusion of citizens in research projects - from start to finish. It creates meaningful research that is rooted in reality and adequately includes people's needs.	Collaborative environmental projects for protection of species for example Including personal health data with explicit consent of the people for research approaches where they have a saying
16	A field of research that aims to investigate the social practices, behaviour and culture of a particular group of individuals or in people in global perspective	Internet mood, trend discussions of social media, census data
17	People without a professional scientific background collaborate or participate in one or many phases of a scientific research.	Volunteer Water Quality Monitoring Networks
18	Research projects with the direct participation of citizens	Data collection making use of the wide distribution of citizen, local samples at a global distribution
19	Participation/support of non-expert individuals/group in the development, planning and evaluation of expert scientific studies.	Monitoring of water/air quality Comet detection by immature astronomers
20	Citizen Science is for me the collaboration of non-experts with experts of a specific field, including research question design, experimental planning and conduction.	Research on social media

21	Scientific work done by scientists in cooperation with the general public	Participatory research, interviewing certain groups of people, questionnaire
22	Involving individuals without scientific credentials/not acting in professional capacity in scientific research	Community environmental monitoring projects, building of a biodiversity database with volunteers, patient-led research
23	science with and for the people, that directly benefits them	city and neighbourhood development
24	It is a scientific endeavor by citizens but not professionally trained scientist through contributions and various modes and level of participation, for the greater public interests by 'generation of any theory or hypothesis, research, scientific data collection, and/or data analysis	Participatory water monitoring, Participatory biodiversity monitoring, Participatory research action, community based monitoring
25	It is about involving people in knowledge creation and giving them access and ownership of knowledge resources	Public archaeology, non-professional but potentially high-quality research
26	Involving public in research, stakeholders beside science.	Food research
27		
28	Citizen science refers to a research approach which involves citizens as co-researchers. There are various ways of involvement - in data collection, co-analysis of data, co-interpretation of data, or co-problem framing.	
29	Non-scientists exploring, questioning, challenging, and constructing evidence-based results.	
30		
31		

**Task two:** citizen science and disciplinary practice

	<b>My discipline</b>	<b>How does my discipline influence the citizen science in it?</b>
1	Marine ecology	Need for long term data sets, can need wide geographic range, can be hypothesis led, opportunistic data collection
2	Material Science	Materials testing, Local materials characterization (building

		materials e.g clays, reeds etc.)
3	Psychology	The way citizen scientists engage in science itself is studied from a psychological standpoint, in this context also different ways to include the participation of diverse groups of citizen scientists, how to keep participants engaged, how to co-create etc.
4		
5	History and Philosophy of Science	Develops techniques for dealing with uncertainty in science
6	Tourism planning	Creating (leisure) opportunities to participate in data collection; involvement in participatory processes at local scale about use and function of spaces; monitoring policy application.
7	Sustainable Urbanism	Involvement in the decision-making process, monitoring policy effectiveness, data gathering and getting high-resolution datasets, geo-data visualisation
8	Cartography and geographical information science	Crowdsourcing geo-data storage and management (geo-database), geodata analysis and visualization
9	Science Education	Students developing their own projects of inquiry with problems they find in their communities, and development of their science identity
10	Ecology	Management of natural resources, community based tourism/ecotourism, species conservation planning, habitat management, livelihood opportunities.
11	Ecology	Sustainability,
12	Learning Sciences	Need for understanding of concepts in life sciences (shown from wide-scale testing), (in-)formal education outside a classroom environment, developing methods for ameliorated science communication
13	Public Health	Patient involvement, intervention/policies evaluation, needs definition
14	Ecology	Generation of data, environmental monitoring, managing natural resources.
15	Global Health	Giving a voice to patients
16	Plant molecular Biology	Sample collection (i.e. biodiversity)
17	Remote Sensing of Global Forest	Reference data collection for ground-truth inventories. Validation and quality assessment of Earth System data

18	History and archaeology	New data is produced by recovering evidence by archaeological discovery or by editing/transcribing/translating/digitising written sources, which can be done by citizen scientists (or anyone with minimum skills), but there is resistance to allowing CS to produce new analysis/interpretation (which requires scientific training).
19	Architecture and Urbanism	DIY urbanism, participatory design processes, influence public policies towards more democratic cities
20	Material science	Outreach activities to engage interest and demonstrate at-home exploration possibilities; currently not very effective at engaging with citizen science in the sense of data collection, etc., but could engage on iteration of materials and structures (e.g., via end-user laser cutters, 3D printers, etc.), on simple characterization of typical materials, etc.
21	Participatory Design/User experience design	Inherently involves lay persons (“users”). They can be involved in all phases of design and testing. Often there is a clear divide between designer and user, which could be improved
22	Hydrology	Hydrological data collected at different spatial and temporal scales, water resources management
23	Rural Sociology	Attitudes towards digital farming by farmers, need of farmers for the innovation development
24	Environment and Sustainability	Environmental monitoring, policy implementation, data collection, policy formulation, decision making, where people can be part of activities and increase environmental awareness.
25	Clinical (and preclinical) research	Patient involvement, involvement of lay people, of the public. Outreach activities. Education of lay people. PPI involvement improves quality and relevance of publicly funded research and improves dialogue and accountability.
26	Open-environmental sensing	Hackers, retirees, teachers, hobbyists - advance scientific tools by making them better, cheaper, and replicable. Tools are used by the community to generate high spatial- temporal-data.
27		
28		
29		
30		
31		