THE OPEN SCIENCE GUIDE OF GUIDES

OPEN SCIENCE AND

Open Access Publishing

Knowledge Justice

Citizen Science

Data Science

By Simon W. , Ina B. et al

BIM-224 SoSe 2021

The Open Science Guide of Guides

Knowledge justice, Open Access Publishing, Data Science, and Citizen Science

by HsH. BIM-224, Open Knowledge, summer term 2021, Blümel

Published by: Open Science Lab and GenR

Last Updated: 1621408651

Created: 1616502737

Language: English

Created by: Simon Worthington

About the Book and Foreword

Tags / topics: open science, introduction, motivation, guides

Impressum

Multi-format versions: Webbook | EPUB | PDF | source

Title: The Open Science Guides Collection

Place: Hannover, Germany

Date: May 2021

Edition / Version: Edition 1, Version 1.0

DOI: 10.5281/zenodo.4740163

GitHub source: https://github.com/TIBHannover/Open-Science-Guides-Collection

The publication is made from a larger collection of Open Science guides on a *GenR* Zotero collection.

Contributors: HsH. BIM-224, Open Knowledge, summer term 2021, Blümel. See GitHub CONTRIBUTE.MD

Foreword

Open Science has become an indispensable part of modern science. There are several definitions of "openness" in relation to different aspects of science - the Open Definition sets out principles as follows “Open means anyone can freely access, use, modify, and share for any purpose (subject, at most, to requirements that preserve provenance and openness).” **Practical guides** for the implementation of those principles in different areas such as research data or publishing are of great importance because they can be used right away.

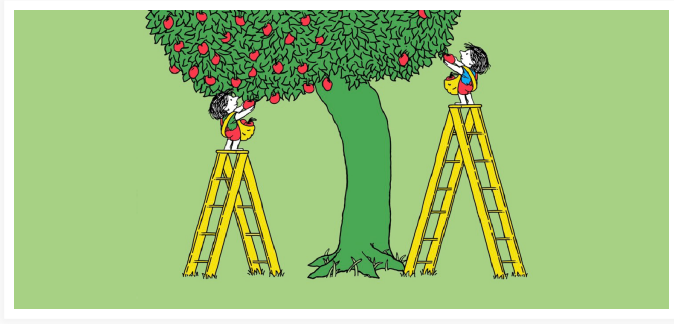
In this compendium, we compile important guides with their specific features and fields of application. The book was written as part of a student seminar at the Hanover University of Applied Sciences and Arts.

Open Science and Knowledge Justice

Contributors: Kaan Ilgaz, Ümit Günes, My Linh Nguyen Thi, Lorenzo Vassao

Tags / topics: Knowledge Justice; equality; equity; justice

Equity vs. Equality: What's the Difference?



Source: "Addressing Imbalance," by Tony Ruth for the 2019 Design in Tech Report.External link:open

Guide name: Equity vs. Equality: What's the Difference?

Target group: public health masters students, health community, policy and system designers

Type: Guide for Masters course

Summary: The guide is an introduction to the difference between equality and equity. Firstly it explains the difference in terms of how society hands out resources and opportunities using the USA 1960 example *The Giving Tree* is an American children's picture book written and illustrated by Shel Silverstein. The core idea being that society is not a natural system and has inbuilt rewards that prioritise social groups.

> *Equity is a solution for addressing imbalanced social systems. Justice can take equity one step further by fixing the systems in a way that leads to long-term, sustainable, equitable access for generations to come.*

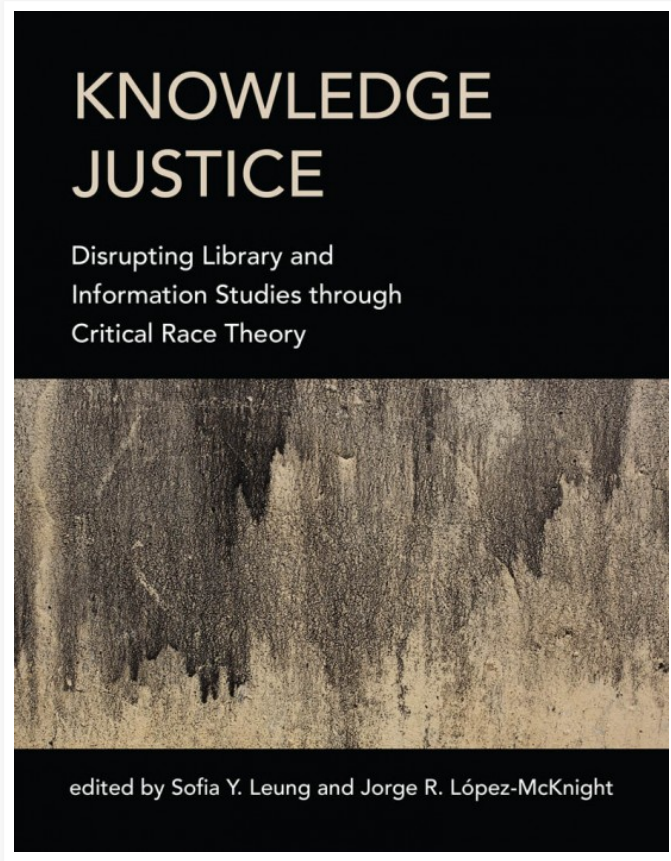
The guide then shows example reccomendations from leading health institutions and how thes define the topic: World Health Organization (WHO), equity is defined: U.S. Centers for Disease Control and Prevention (CDC) refers to health equity: and, Or, as the Race Matters Institute desribes.

The guide then shows examples of how equality and equity differ in policy, for example:

> Equality - A city cuts the budget for 25 community centers by reducing the operational hours for all centers by the same amount at the same times.
> Equity - The city determines which times and how many hours communities actually need to use their community centers and reduces hours for centers that aren't used as frequently.

Short case studies of programmes are described and a list of additional resources given.

Knowledge Justice: Disrupting Library and Information Studies through Critical Race Theory



Guide name: *Knowledge Justice: Disrupting Library and Information Studies through Critical Race Theory*

Target group: The target audience of this book are people who want to research basic information and the possibilities of Open Science. Furthermore, Open Science should be accessible to everyone and everyone should have equal rights.

Type: Recommendations for Practice

Summary: In Knowledge Justice, scholars from diverse ethnic backgrounds draw on critical race theory to challenge the fundamental principles, values and assumptions of library and information science in the United States. This is intended to lead the profession to understand how "white" supremacy affects practices, services, curricula, spaces, and policies.

The authors describe that a misconception of the neutrality and objectivity of library and information science comes from the influence of the different ethnicities of scholars. Through in-depth analyses of library and archival collections, scholarly communication, power hierarchies, epistemic domination, children's libraries, teaching and learning, digital humanities, and the education system, Knowledge Justice calls for the abolition of so-called "white supremacy" in order to create racial justice for every group of people.

Labour of Love: An Open Access Manifesto for Freedom, Integrity, and Creativity in the Humanities and Interpretive Social Sciences

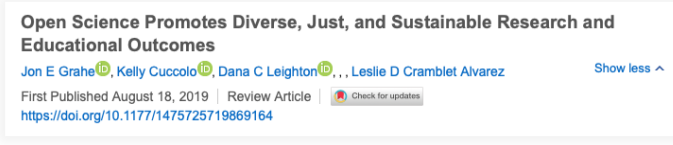
Guide name: Labour of Love: An Open Access Manifesto for Freedom, Integrity, and Creativity in the Humanities and Interpretive Social Sciences

Target group: Social sciences, academics, journal editors, provosts

Type: Manifesto, reccomendations

Summary: The article deals with the development of Knowledge Justice and Open Science. In recent decades, Open Science is said to have become increasingly relevant through many initiatives and other movements, and even Unseco (United Nations Educational, Scientific and Cultural Organization) has made recommendations in this regard. Open Science has changed the culture and this change should be promoted. GenR offers to help with these changes by working with the community.

Open Science Promotes Diverse, Just, and Sustainable Research and Educational Outcomes



Guide name: *Open Science Promotes Diverse, Just, and Sustainable Research and Educational Outcomes*

Target group: Researcher, who are interesed in Open Science which promotes diverse, just, and sustainable research and educational outcomes

Type: Analysis for evaluation purposes

Summary: Open science initiatives have become increasingly popular in recent decades. They offer the opportunity to promote diversity, equity and sustainability by supporting diverse, equitable and sustainable outcomes. This review examines models that demonstrate these aspects in the psychological economy and describes how open science initiatives promote these values. Diversity, equity and sustainability questions are offered that can be used to evaluate research outcomes.

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MPH@GW, the George Washington University, “Equity vs. Equality: What’s the Difference?,” November 5, 2020, https://onlinepublichealth.gwu.edu/resources/equity-vs-equality/.

Sofia Leung and Jorge López-McKnight, *Knowledge Justice: Disrupting Library and Information Studies through Critical Race Theory* (The MIT Press, 2021), https://www.amazon.com/Knowledge-Justice-Disrupting-Information-Critical/dp/0262043505#detailBullets_feature_div.

Andrea E. Pia et al., “Labour of Love: An Open Access Manifesto for Freedom, Integrity, and Creativity in the Humanities and Interpretive Social Sciences,” *Commonplace*, July 16, 2020, https://doi.org/10/gh6fjn.

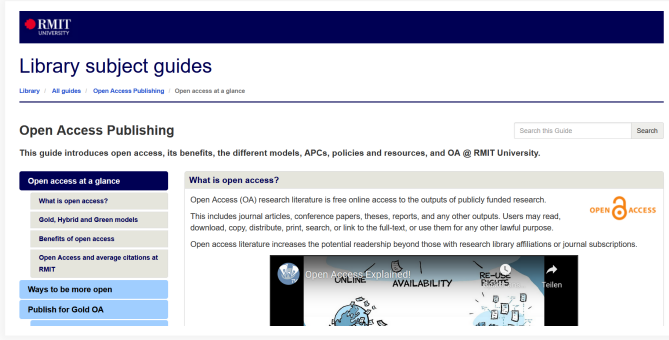
Jon E Grahe et al., “Open Science Promotes Diverse, Just, and Sustainable Research and Educational Outcomes” 19, no. 1 (August 18, 2019): 5–20, https://doi.org/10/gf75bp.

Open Science and Open Access Publishing

Contributors: Maria Sael, Sabrina Gaab, Mohammad Al Nasouh, Edith Reschner

Tags / topics: Open Access, Open Science, Open Access Publishing, Open Licence, Scholarly Publishing, APCs, Author Rights, Copyright

Open Access Publishing



Screenshot of the guide on the RMIT-Website

Guide name: *Open Access Publishing*

Target group: The primary audience for this guide is college students, and especially the RMIT-University students, as open source resources for educational purposes to achive academic success.

Type of guide: A guide was written by Karen Macvean and published in the online library RMIT - Global University of Technology, Design and Economics to explain everything about Open Access briefly using different exploration methods such as explanatory videos, charts, illustrations, and Text such as Step by step, checklist.

Summary: The guide explains the idea behind Open Access, its models such as Gold, Hybrid, and Green Open Access. An illustration also shows the benefits of open access in different disciplines. The difference in the citation volume of Open Access publications compared to non-Open Access publications is also shown in a diagram. Further tips on how to make research more open are listed as well as information on what preprints are, why, and how preprints can be shared are listed. The guide includes a

list of open-access resources, such as Organizations, Directories, and Tools. The guide addresses FAIR principles, policies, and ethics, data planning, storing, and sharing data. Reading this guide will help with choosing the right type of publication, be it in journal articles, books and book chapters, conference papers, or non-traditional research (NTROs). The guide also provides an overview of copyrights and Information on Article Processing Charges (APCs) that should be checked before paying a journal.

Von Open Access zu Open Science: Zum Wandel digitaler Kulturen der wissenschaftlichen Kommunikation

Cover: "Von Open Access zu Open Science"

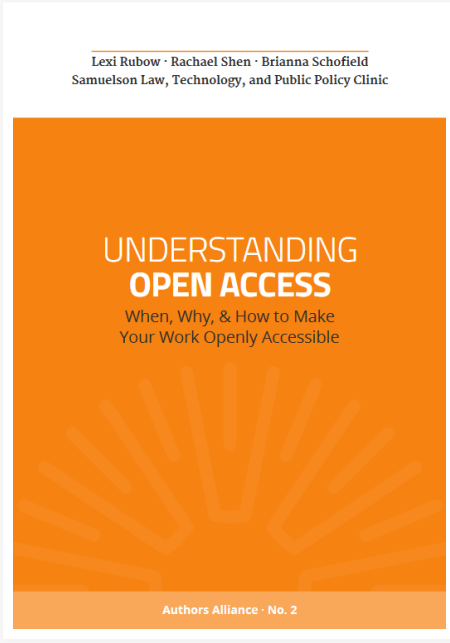
Guide name: *Von Open Access zu Open Science: Zum Wandel digitaler Kulturen der wissenschaftlichen Kommunikation*

Target group: [...]

Type of guide: With the help of an experiment, this handbook presents the chances of and barriers to Open Access.

Summary: The call for free access to scientific research results and an opening up of the research process goes hand in hand with digitisation in science. Open Access and Open Science are the key terms of this transformation process, which is euphorically welcomed by some and strongly rejected by others. Based on a quantitative survey and a reflexive experiment, the book provides insight into the current debates on the opportunities as well as the obstacles of opening up science.

Understanding Open Access. When, why, & how to make your work openly accessible



Cover

Guide name: *Understanding Open Access. When, why, & how to make your work openly accessible*

Target group: The guide is for authors of all backgrounds, fields, and disciplines, from the sciences to the humanities.

Type of guide: This guide is the product of extensive interviews with authors, publishers, and institutional representatives who shared their perspectives on open access options in today's publishing environment. The information, strategies, and examples

included in this guide reflect the collective wisdom of these interviewees.

The basic structure of this step-by-step guide traces the process of how an author would decide whether and how to make a work openly accessible. Therefore, this design is intended to help with each step of the decision-making-process when thinking about Open Access Publishing.

Summary: This Guide provides a scholarly author-oriented look at the ins and outs of open access publishing. It addresses common concerns about what "open access" means, how institutional open access requirements work, and why authors might consider making their work openly accessible online. Furthermore, it provides the reader with real-life strategies and tools that can be used to work with publishers, institutions and funders.

Following the Introduction, there are three more sections at hand: Section II addresses the trade-off of whether to make the work openly accessible or not. Section III then explains how to do so by giving advices on how "open" to make the work, where to make it openly availabe to the public and also how to secure the right to use third-party content in the later openly accessible work. Also included are strategies on how to make the work openly accessible while also publishing it through a conventional publisher. Finally, the guide concludes with Section IV, a window on the future of open access.

Open Access publizieren – Fragen & Antworten

Cover image

Guide name: *Open Access publizieren – Fragen & Antworten*

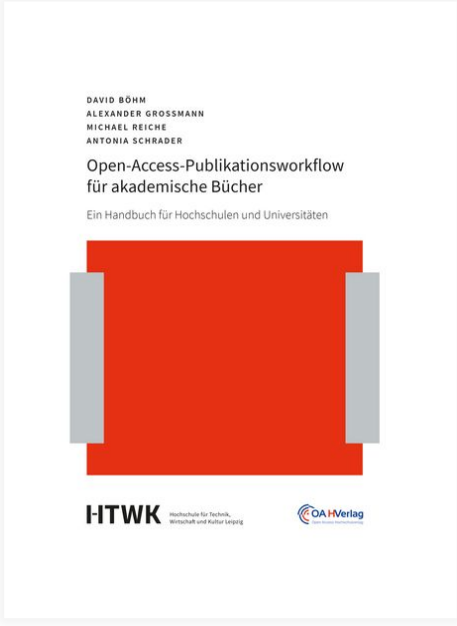
Target group: This guide is for visitors who have questions about the topic of Open Access (OA). These visitors can be academics, authors who want to publish their publications on OA or regular visitors such as students, private visitors etc. who want to learn more about the topic of Open Access publishing.

Type of guide: Website giving an overview of important questions and answers on Open Access publications.

Summary: This guide answers important questions about the topic of Open Access (OA). Firstly, it discusses who can publish OA. Secondly, it explains the two publication Roads: "Gold" Road and "Green" Road. It also mentions how OA journals are financed and explains the costs of an OA publication. In addition, the two options "OA journals" and "repositories" on OA publishing are mentioned. OA affords the possibility to make the knowledge

generated as accessible and usable as possible for readers and other researchers. This guide therefore mentions how to find research results on OA. Furthermore, the topic of copyright is addressed. Moreover This guide contains a short video mentioning the advantages of OA. Firstly, scientists are noticed internationally. Secondly, knowledge is shared across the world etc. The video additionally discusses the quality of OA publications and points out that there are an increasing number of authors who publish their work on OA.

Open-Access-Publikationsworkflow für akademische Bücher



Cover image

Guide name: Open-Access-Publikationsworkflow für akademische Bücher

Target group: This guide is for universities that want to publish their publications both as Open Access and printed books.

Type of guide: This is a book presenting a workflow for producing and publishing academic books in digital form on Open Access and as a printed book.

Summary: The immediate, transparent and sustainable dissemination of verifiable scientific results is one of the essential requirements for scientific communication and infrastructure. Open Access, i.e. the open and free use of scientific literature, is the basic prerequisite for this. Colleges and universities are usually the institutions where scientists generate new research results and prepare them for publication in book form. In addition to traditional academic publishers, more and more university presses are therefore publishing academic publications. In the present manual a sustainable and ideal workflow for producing and publishing academic books is presented. That workflow enables universities to publish their publications both as Open Access and printed books in a state-of-theart way and without any restrictions regarding the license, the variety of formats, print run etc. This workflow model will be demonstrated as a proof of concept using selected case studies and reflects the current state of technical and economic technical and economic possibilities in the publishing sector. On the basis of the case studies, the time, costs and personnel involved were also recorded, so that other higher education institutions and universities can be given pointers for the necessary investments in founding and operating their own OA university publishing houses are provided.

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Open Science and Data Science

Contributors: Falkewitz, Philip; Görzen, Linda; Matern, Johannes; Shahbazi, Kian

Tags / topics: Data Science; Machine Learning; Big Data; Python; Best practices; Reproducible research

Big Data and Open Science Data

Guide name: *Big Data and Open Science Data*

Type: step-by-step, instructions

Target group: Data researchers who are looking for a roadmap on Open Science Data

Summary: This article is about Big Data research and its content sharing. The goal here is to disclose benefits to support the promotion of Open Science. The article describes the problem of the high volume of Big Data and thus opacity, as well as the positive effect of data sharing of such data volumes. The article is divided into 4 sections.

1. problem definition
2. state of research
3. advantages of Open Science

4. future outlook

Perspectives on open science and scientific data sharing

Guide name: *Perspectives on open science and scientific data sharing: an interdisciplinary workshop*

Type: step-by-step, instructions, workshop

Target group: scholars and researchers of all scientific domains who are looking to share or access open data

Summary: This article is looking at Open Data and Open Science in general, and does not focus on a specific domain. The goal behind it is to promote communication and interaction between scholars who are working with (open access) papers. The content consists of summaries of presentations from a meeting. The article is structured in four issues:

1. The establishment of a common framework and a general discussion about principles of open data, values and opportunities.
2. Insights about scientific practices, especially how the open data movement is developing in specific scientific domains.
3. A case study of homan genomic, which was one of the first big shared documents, which demonstrated the boundaries between large scale

data sharing, the boundaries of openness and protection of individual data.

4. A discussion about the public communication fo science and the role of the public in it. This point includes proposals for initiatives on open science. These are integrating a top-down initiative by the gevernments, institutions and journals, in combination with a bottom-up approch von the community. Popularizing the benefits is also a propsal, which is being made, which includes explaining the benefits.

Support Your Data

Guide name: *Support Your Data: A Research Data Management Guide for Researchers*

Type: Toolset for self-assessment, series of short guides

Target group: researchers working in different institutional and disciplinary contexts

Summary: Researchers are faced with rapidly evolving expectations about how to manage and share their data, code and other research materials. To help them meet these expectations and generally manage and share their data more effectively, there are series of tools called Support Your Data.

These tools include a rubric designed to allow researchers to self-assess their current data management practices.

Included are self-assessments of their current data management practices and a series of short guides that provide actionable information on how to improve practices based on need or desire.

These are designed to be easily adapted to the needs of researchers working in different institutional and disciplinary contexts.

Recommendations for open data science


COMMENTARY | Open Access | Published: 18 May 2016

Recommendations for open data science

Melissa Gymrek & Yossi Farjoun

GigaScience **5**, Article number: 22 (2016) | Cite this article

2060 Accesses | **5** Citations | **24** Altmetric | Metrics

Guide name: *Recommendations for open data science*

Type: Instructions for action

Target group: Life sciences, but also most other scientific disciplines

Summary: The authors criticise that the computational analyses used in research are usually not published with the research results. This makes the research results non-transparent and difficult to understand. This practice needs to change in the sense of the open science movement. For this purpose, scientific communities should follow the guidelines presented:

1. The tool software used should be made available or cited in public repositories.
2. Make pipelines available or cite them in public repositories
3. Teach data science to researchers
4. Publishers and reviewers must enforce reproducibility of computations

The authors refer to life science. However, the instructions for action can be applied to most other scientific disciplines.

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Open Science and Citizen Science

Contrubtors: Franziska Ahlborn; Mary Sermus

Tags / topics: Citizen Science; Citizen Science to monitor biodiversity; Citizen Science to study biodiversity and the environment in the UK; Citizen Science and public understandig

Citizen science for all - A guide for citizen science practitioners

Citizen Science

Guide name: *Citizen Science for All*

Target Group: This guide is primarily intended for those initiating citizen science projects, but also for anyone participating in such projects.

Type: Guide with practical instructions.

Parts: Part 1: The Practice of Citizen Science describes the Practice of Citizen Science in Germany. Part 2: The Landscape of Citizen Science presents the possible uses of this participatory approach in various research disciplines and fields.

Summary: This guide describes how Citizen Science is practiced in Germany and how this participatory approach can be used in different research disciplines and thematic areas - such as education, nature protection or the humanities. The guide is

addressed primarily to initiators of Citizen Science projects, but also to all those who participate in such projects. This includes scientists working in research institutions who want to work with citizens, but also individuals and community groups such as independent scientific groups and associations. This guide is the result of intensive collaboration between a wide range of stakeholders in the citizen science community in the Citizens Create Knowledge Project (BürGEr schaffen WISSen, GEWISS). It is based on insights gained at dialogue forums and other events. Some stories about the projects were received from workshop participants at the Citizen Science Forum in March 2016.

Citizens Create Knowledge – Knowledge Creates Citizens (BürGEr schaffen WISSen – Wissen schafft Bürger, GEWISS) is a capacity-building programme aimed at strengthening citizen science in Germany.

Choosing and Using Citizen Science - A guide to when and how to use citizen science to monitor biodiversity and the environment

Guide name: *Choosing and Using Citizen Science*

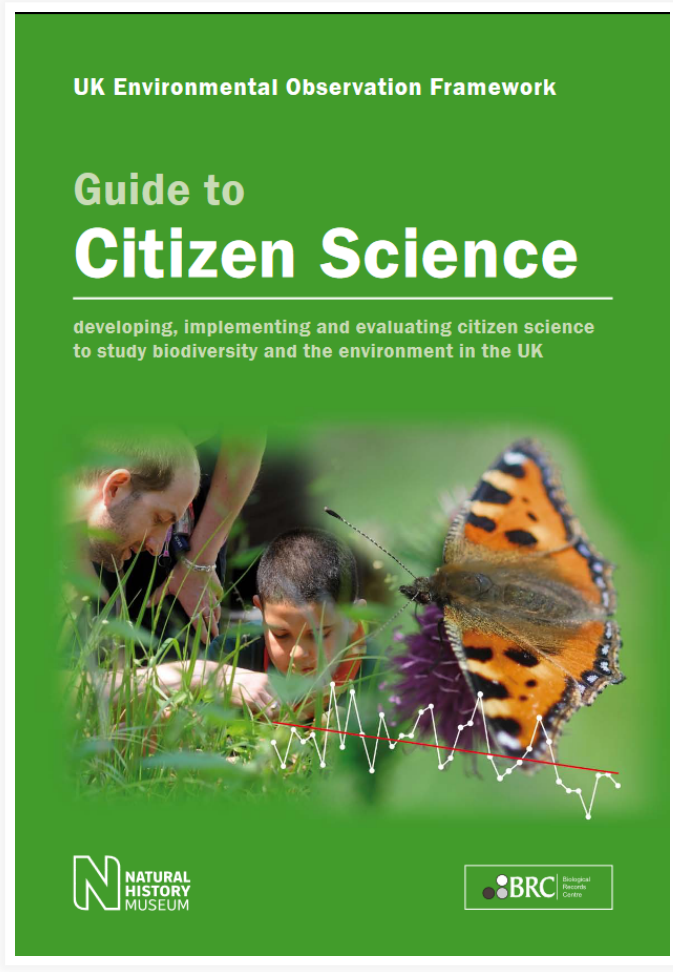
Target Group: people who are considering whether a citizen science approach can contribute to their work.

Type: Decision-framwork scheme for selecting and using citizen science. This guide does not cover the practical details of developing a citizen science project.

Parts: This guide should help people to discover: 1. whether citizen science is suitable for your proposed project, and; 2. what type of citizen science is most appropriate for you to adopt. Decision framework will help people to more clearly understand the potential opportunities and limitations of citizen science.

Summary: Citizen science can be a very useful "tool" for research and monitoring. There are many different ways to involve volunteers in real science activities. This variety can be very larg for those trying to organize citizen science activities, and citizen science will not always be the most appropriate or optimal approach for research or monitoring.Here is a guide to support people considering a citizen science approach, especially (but not necessarily limited to) biodiversity and environmental monitoring in the UK. It will help you decide whether citizen science can be useful, and help you decide which broad citizen science approach is most appropriate for your issue or activity.

Guide to Citizen Science - developing, implementing and evaluating citizen science to study biodiversity and the environment in the UK



Guide name: *Guide to Citizen Science*

Target Group: People who have been involved in Citizen Science and people who are new to this field of science within the UK.

Type: Guide for a specific Citizen Science domain of application, written by scientists at the Biological Records Centre und he natural History Museum Angela Marmint Centre for UK Biodiversity, on behalf of the UK Environmental Observtion Framework.

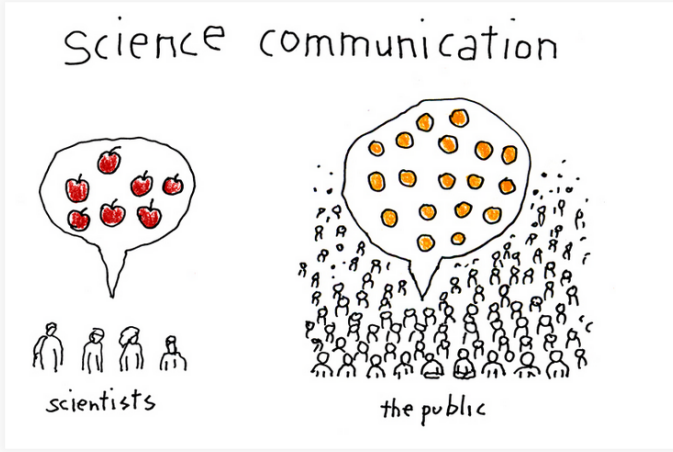
Parts: The guide helps citizen who are interested in starting a project (or have already been involved in Citizen Science) step-by-step through the whole process, giving tips and examples of Citizen Science projects.

Summary: Much of the UK's understanding of its flora and fauna today is based on the engagement of natural scientists. Citizen Science initiatives to collect environmental data range from crowd-sourcing activities to small groups of volunteer experts collecting and analysing environmental data and sharing their findings with others. Given the different methods of collecting data, it is important that they are well planned and executed. This will not only help science, but also promote environmental awareness among citizens.

This Guide explains the different approaches to Citizen Science, the first steps to building a team, defining goals, funding the project and finding participants. It guides through the different phases of such a project: the development phase, the live phase and the phase of analysing the data, interpreting it and reporting the results.

It is based on information collected and analysed as part of the UK-EOF funded project "Understanding Citizen Science & Environmental Monitoring".

Can Citizen Science enhance the public understanding of Science?



Cartoon by Tom Dunne

Guide name: *Can Citizen Science enhance the public understanding of Science?*

Target Audience: Researchers, those who are interested to learn the accomplishments of Citizen Science.

Type: Theoretical research work, written by four scientists Rick Bonney, Tina B. Phillips, Heidi L. and Jody W. Enck.

Parts: The research paper studies the reason why citizen science has become so widespread, explores the accomplishments of Citizen Science its the different categories and the four categories in which effort and resources are needed for projects to expand their influence.

Summary: The publication provides strong evidence that the scientific outcomes of Citizen Science are well documented, especially for data collection and processing projects. Furthermore

Citizen Science achieves knowledge growth about scientific knowledge and processes among its participants, increases public awareness on the diversity of scientific research, and gives deeper meaning to participants' hobbies.

Citizen Science can contribute positively to social well-being by influencing the issues being addressed and giving people a voice in local environmental decisions. To achieve this, Citizen Science projects require efforts in these four areas: (1) project design, (2) outcome measurement, (3) engaging new audiences, and (4) new research directions.

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